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An Economic Analysis of Agricultural Soil Loss in Mitchell County, Texas

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Any errors or ommissions are the sole responsibility of the authors.

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INTRODUCTION

The Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, established a national goal of eliminating the discharge of pollutants into the nation's waterways by 1985. As a step toward that goal an interim water quality standard of "fishable, swimmable waters nationwide" by July 1, 1983 was set. Under section 208 of this law, each state was required to establish a "continuing planning process" to define controls for agricultural non-point sources of water pollution.

Section 208 calls for the development of state and area-wide water quality management plans. The plans are to include "a process to (i) identify if appropriate, agriculturally and silviculturally related non-point sources of pollution, including runoff from manure disposal areas, and from land used for livestock and crop production, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources."

In an earlier group of technical reports (TR 87, 88, 90, 93) in this series a model was developed to measure the net social benefits from controlling agricultural sediment given various policy options. This was done by contrasting benefits to be gained from reducing the sediment load in a watershed against costs involved in achieving that reduction using various voluntary or mandatory policies to accomplish the reduction. It was a major conclusion of these studies that no policy that restricted soil loss to less than that which was economically desirable from the farmers own viewpoint would generate benefits greater than the costs involved. This finding, in the watersheds of major sediment control concern lead to a decision to change the base area for this report to a county instead of a watershed and to only deal with the on-farm consequences of various management practices. These on-farm consequences would include the changes in topsoil loss and the yield losses that result from losing topsoil. Also included are profit levels that could be expected from different management practices and how the present value of a stream of these profits would vary over different planning horizons.

DESCRIPTION OF THE COUNTY

Mitchell County is located in the Rolling Plains Land Resource Area in the west-central part of Texas (figure 1). Agriculture is the major occupation in the county. Approximately one-third of the 590,000 acres in the county is cropland with most of the remainder used for cattle raising. Cotton, grain sorghum, and small grains are the principle crops. Most of the cropland is under dryland cultivation, with only a couple of thousand irrigated acres in the county.

Near the southwestern edge of the Rolling Plains, Mitchell County is nearly level to undulating with areas of short, rough breaks along the Colorado River and its major tributaries. Elevation ranges from 1900 to 2400 feet above sea level.

The entire county is drained by the Colorado River, which crosses in a southeasterly direction. Major tributary streams in the eastern part of the county are Lone Wolf Creek, Champion Creek, and Big Silver Creek. In the western part the main tributaries are Morgan Creek and Beals Creek.

The western part of the county is broad, low-lying and nearly level, locally called flats. It consists of alluvial bottomlands, which occur a few feet above the beds of Morgan and Beals Creeks, and nearly level uplands that are slightly higher than the bottomlands. These flats are relatively well drained. The soils are clayey and take water slowly, but relief is such that ponding, if any, is not prolonged. Dotting the flats are low, gently sloping to steep, hills rising 50

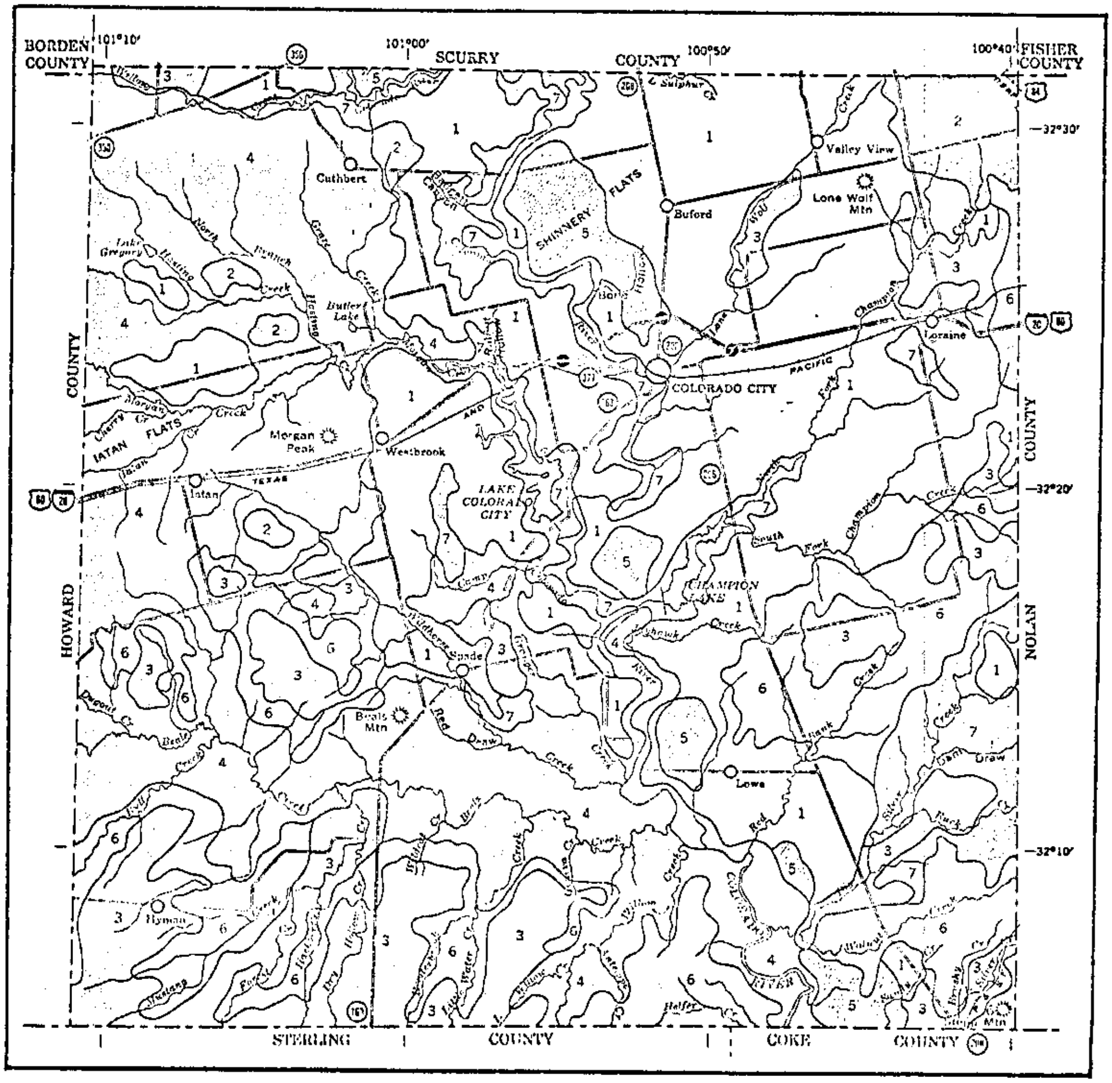

Figure 1. Mitchell County.

to 150 feet above the plain.

Extending into the northeastern corner of the county is a nearly level undissected, well drained upland plain. This area, which lies at the highest elevation in the county, includes a few playas suitable for crops though they may be ponded for a few weeks after heavy rains.

Another nearly level, well drained, upland plain occurs in the southwestern corner of the county. Dissecting this plain are several small, intermittant streams.

The rest of the county consists of nearly level to gently undulating well-drained upland that is cut by many small streams. Along these streams are narrow terraces and flood plains consisting of level, well drained, loamy soils. In some places along the streams and along the escarpment between the erosional uplands and lowlying flats are short, steep slopes forming rough, broken land that is nearly barren.

Soils in the county are in general level to moderately sloping, clay loam or fine sandy loam. Dominant soil associations in the county are Cobb-Miles, Rowena, Uvalde, Stamford-Vernon, Tivoli-Brownsfield, Potter-Mansker and Spade-Latom. The soil mapping units that make up these associations and the approximate acreage of each are listed in table 1. Also listed in table 1 is the four character alpha-numeric code by which each mapping unit is identified in the remainder of the report.

Mitchell County lies in an area that is transitional between the humid climate of east Texas and the semi-arid climate to the west.

Table 1. Acreages of Cropland and Rangeland in Mitchell County by Soil Mapping Unit. [a/]

Soil Mapping Units	Identification Code	Total Acreage
Acuff loam, 0-1% slopes	AC01	9,137
Acuff loam, 1-3% slopes	AC13	7,963
Altus fine sandy loam	AFSL	7,021
Brownfield fine sand	BFFS	8,402
Clayey alluvial land	CYAL	24,484
Cobb and Miles fine sandy loams, 1-3% slopes	CM13	85,545
Cobb and Miles fine sandy loams, 3-5% slopes	CM35	11,453
Cottonwood loam	CWLM	163
Latom-Roch outcrop complex	LROC	14,261
Loamy alluvial land	LYAL	10,092
Mangum clay	MGCY	545
Mansker loam, 0-1% slopes	MK01	752
Mansker loam, 1-3% slopes	MK13	18,722
Mansker loam, 3-5% slopes	MK35	3,154
Merta clay loam, 0-1% slopes	MM01	3,059
Merta clay loam, 1-3% slopes	MM13	9,350
Miles fine sandy loam, 0-1% slopes	MN01	7,460
Miles loamy fine sand, 0-3% slopes	MO03	10,717
Miles loamy fine sand, 3-5% slopes	MO35	1,095
Olton clay loam, 0-1% slopes	OC01	6,577
Olton clay loam, 1-3% slopes	OC13	9,712
Potter soils	PTSS	39,989
Roscoe clay	RCCY	1,363
Rough broken land	RHBL	9,566
Rowena clay loam, 0-1% slopes	RW01	20,123
Rowena clay loam, 1-3% slopes	RW13	10,999
Spade fine sandy loam, 1-3% slopes	SA13	20,292
Spade fine sandy loam, 3-5% slopes	SA35	7,726
Spade-Latom sandy loams, 3-5% slopes	SL35	4,796
Spur clay loam	SCYL	8,214
Stamford and Dalby clays, 0-1% slopes	SY01	37,930
Stamford and Dalby clays, 1-3% slopes	SY13	39,519
Tivoli fine sand	TFSD	12,193
Uvalde silty clay loam, 0-1% slopes	US01	34,728
Uvalde silty clay loam, 1-3% slopes	US13	27,188
Vernon soils, 1-3% slopes	VS13	20,427
Vernon-Badland complex	VBCX	30,902
Weymouth clay loam, 1-3% slopes	WC13	9,665
Artificial lakes		4,796
Total		590,080

[a/] Source: U.S. Department of Agriculture Soil Conservation Service. Soil Survey Mitchell County, Texas. U.S. Government Printing Office, Washington, D.C., April 1969.

The average annual precipitation is 19.79 inches. However, because this rain falls mainly during thunderstorms the amount varies widely from year to year and from place to place. About 78 percent of the rainfall occurs during the warmer months of the year, April through October.

In the winter the temperature can fall rapidly when cold polar air surges down from the north. Cold spells are short, however, and periods of relatively mild weather are frequent. In the summer there are long periods when daytime temperatures are high. The average daily maximum temperature reaches 97°F. in both July and August. The average freeze-free season is 219 days.

In the period from 1970 to 1976 approximately 55,000 acres have been planted to cotton each year, 27,000 acres to grain sorghum and 12,000 acres to wheat and other small grains. Table 2 lists the complete breakdown of agricultural land use by acreage and percent.

In a 1976 survey of conservation problems in Texas as viewed by the Soil and Water Conservation District Directors, agricultural non-point source pollutants in the Rolling Plains Land Resource Area were rated as a problem of slight to moderate severity, as were floods. They were ranked fourteenth and tenth, respectively, among the area's problems. However, water erosion, as an on-farm soil management problem, and the economics of conservation were ranked second and third, being considered problems of moderate to severe proportions. Thus, the on-farm erosion problem is viewed as more critical than the off-farm down-stream flooding and pollution problem. Complete survey results for the Rolling Plains Resource Area are given in table 3.

Table 2. Average Agricultural Land Use in Mitchell County for the Years 1970-1976. [a/]

Land Use	Acreage	Percent
Cropland		
Cotton	55,229	9.4%
Grain Sorghum	26,871	4.6%
Wheat, small grains	11,770	2.0%
Hay and Pasture	10,400	1.7%
Range	397,299	67.3%
Miscellaneous [b/]	88,512	15.0%
Total	590,080	100.0%

[a/] Source: Texas Department of Agriculture and USDA Statistical Reporting Service. Texas County Statistics. Compiled by Texas Crop and Livestock Reporting Service. Austin, Texas, 1970-1976.

Table 3. Soil and Water Conservation District Directors' Rating of Conservation Problems in the Rolling Plains Land Resource Area. [a/]

Problems	Rank	Present Severity [1/]	Change in Condition in Past 10 Years [2/]
Water-Related Problems			
1 Non-Point Source Pollution			
i Agricultural Non-Point Source Pollutants	14	1.36	+.41
ii Silvicultural Non-Point Source Pollutants	23	.73	.00
iii Mining Operations Non-Point Source Pollutants	19	1.05	-.02
iv Construction Site Non-Point Source Pollutants	17	1.20	-.14
v Waste Disposal Non-Point Source Pollutants	12	1.45	-.05
vi Salt Water Intrusion	12	1.45	-.16
vii Hydrologic Modifications	21	.91	+.05
2 Floods	10	1.66	+.36
3 Inadequate Drainage	20	1.00	-.02
4 Inefficient Irrigation Systems	16	1.27	+.07
5 Improper Use of Groundwater	18	1.18	+.05
Soil Management Problems			
6 Water Erosion	2	2.27	+.59
7 Wind Erosion	8	1.80	+.54
8 Soil Compaction	13	1.41	+.50
9 Inefficient Tillage Systems	8	1.80	+.43
10 Salinity	15	1.32	-.07
11 Loss of Soil Moisture	6	1.89	+.36
Plant Management Problems			
12 Undesirable Brush & Weeds	1	2.66	-.09
13 Weeds on Cropland	5	1.95	+.02
14 Difficulty of Grass Establishment	4	2.06	+.57
15 Overgrazing	3	2.11	+.50
Other Problems, Issues, and Policies			
16 Economics of Conservation	3	2.11	-.75

Scale of Present Severity [1/]

0 - 1.5	Slight to None
1.5 - 2.5	Moderate
2.5 - 3.5	Severe
3.5 - 4.5	Very Severe

Scale of Change in Condition in Past 10 Years [2/]

-1.5 - -2.5	Much Worse
-0.5 - -1.5	Worse
-0.5 - 0	Slight Decline
0 - 0.5	Slight Improvement
0.5 - 1.5	Better
1.5 - 2.5	Much Better

[a/] Source: Association of Texas Soil and Water Conservation Districts. Conservation Problems in Texas, Temple, Texas, October 1976.

THE APPROPRIATE PLANNING HORIZON AND DISCOUNTING FUTURE BENEFITS AND COSTS

The effect of soil conservation and erosion control on the agricultural economy is felt only over a period of years as the mix of inputs change for a given output. Erosion carries away topsoil reducing soil fertility and reducing crop yields. If erosion is slowed, future crop yields will be higher than they would otherwise have been given the same level of management.

Farmers make many short-run decisions because they are concerned with next year's income. On the surface this suggests that farmers would use a short time horizon for planning conservation practices. However, most farmers and landowners are concerned about the future value of their land in addition to inoome flow. Inasmuch as the agricultural component of land values is the capitalized value (present value) of a highest and best use profit stream into perpetuity, and given the limited alternative uses for agrioultural land in this part of Texas, the value of the land is tied closely to its future agricultural productivity. Thus, it was important that this study consider not only present productivity but also the effect on future productivity, and hence land values, of cropping and conservation practices. Therefore, a long planning horizon is essential when determining appropriate combinations of crop rotations and conservation practices a landowner should employ. In order to emphasize this point and to demonstrate the importance of the length of the planning horizon, calculations were made for time horizons of 10, 100 and 200 years.

Discounting Future Benefits and Costs

As a point of reference from which to calculate the present value of future benefits and costs, 1977 was designated the base year.

All future benefits and costs were discounted to 1977 dollars using standard discounting techniques and a real interest rate of approximately 1.5 percent. The 1.5 percent rate was calculated by assuming that the long-run real interest rate was approximated by the difference of inflation and bank interest rates for the last 10 years. The average inflation rare of the last 10 years, which is 5.8 percent, was thus subtracted from the 7.3 percent average private interest rate charged by banks over the same 10 year period to arrive at the 1.5 percent real interest rate.

The present values of net returns associated with particular crop production activities are given in this study. Present value of net returns was computed as:

$$PV = \sum_{t=0}^{T} \left[\frac{(B_t - C_t)(1 + i)^t}{(1 + r)^t} \right]$$

where

Σ = summation of discounted benefits and costs over time

t = time, in years

B_t = gross benefits in year t

C_t = gross costs in year t

i = inflation rate (i.e., 5.8 percent)

r = nominal interest rate (i.e., 7.3 percent)

T = length of planning horizon

ON-FARM ECONOMICS OF SOIL CONSERVATION

In order to study on-farm income consequences of soil conservation, a great deal of data both technical and economic is necessary. Data required for this type of analysis include: (a) expected yields of all relevant crops for each soil in the watershed; (b) expected prices for each crop and associated production costs; (c) additional costs for the applicable conservation practices; (d) expected soil loss associated with each cropping practice--soil type combination; and (e) effects of crop rotations on yield of individual crops. These sets of data were combined to estimate the net present value return for each crop rotation--conservation practice--soil mapping unit combination over time periods of 10, 100 and 200 years.

Crop Yields

Table 4 gives the expected yield of four major crops in Mitchell County for each soil mapping unit plus the yield of range grasses that could be expected if the land is not cropped.

Yields for irrigated crops are given for those few soils that are presently irrigated. Though irrigation would increase yields on several of the soils, the amount of irrigated land is not increasing nor is it expected to in the foreseeable future due to the lack of additional water for irrigation. All yields are for a high level of management.

Table 4. Crop Yields for Each Soil Mapping Unit in Mitchell County.

Soil	Cotton (lbs.)	Grain Sorghum (bu.)	Wheat (bu.)	Hay or Pasture (tons)	Range (AUM)	Irrigated		
						Cotton	Grain Sorghum	Wheat
AC01	200	23.33	18	2.5	.6	900	112.0	50
AC13	175	18.67	16	2.5	.6	750	93.3	45
AFSL	350	42.00	22	2.9	.7			
BFFS	175	18.67		2.9	.9			
CYAL	150	18.67	15	2.1	.5			
CM13	200	18.67	18	2.9	.9	500	65.3	40
CM35	150	14.00	15	2.9	.9		56.0	35
CWLM					.3			
LROC					.3			
LYAL	225	23.33	20	2.5	.9			
MGCY	150	18.67	15	2.1	.5			
MK01	150	16.67	12	2.1	.6	350	46.70	25
MK13	125	13.07	10	2.1	.6		37.30	20
MK35				2.1	.6			
MM01	200	23.33	20	2.1	.9			
MM13	150	18.67	15	2.1	.9			
MN01	300	28.00	20	2.9	.8	700	79.30	50
MO03	250	23.33	15	2.9	.6	650	70.00	35
MO35					.6			
OC01	200	18.67	16	2.5	.6			
OC13	175	14.00	14	2.5	.6			
PTSS					.2			
RCCY	225	28.00	20	1.7	.5			
RHBL					.2			
RW01	250	32.67	25	2.5	.7			
RW13	225	28.00	25	2.5	.7			
SA13	175	18.67	15	2.9	.7			
SA35		14.00	12	2.9	.7			
SL35					.4			
SCYL	225	23.33	20	2.9	.9	900	102.70	60
SY01	200	23.33	15	2.5	.5			
SY13	150	18.67	15	2.5	.5			
TFSD					.5			
US01	300	51.33	20	2.5	1.3			
US13	250	46.67	20	2.5	1.3			
VS13					.5			
VBCX					.5			
WC13	150	14.00	10	2.5	.6			

A high level of management and input quality was assumed for this study to make the comparison between conventional straight row cultivation practice and conservation till or terracing practices as realistic as possible. A higher level of management is necessary to successfully use conservation tillage or terracing and thus it would not be a fair comparison if they were compared to a conventional system with a lower level, more typical management.

The higher level of management would include a greater use of fertilizer, insecticides and pesticides, and better seed varieties for row crops. On pasture or range land cross fencing and rotational grazing would be utilized along with improved grass species, brush control on rangeland and careful adjustment of livestock numbers as necessary to make the best use of the available grass. The yield data were furnished by USDA Soil Conservation Service and Texas Agricultural Extension Service personnel familiar with the area.

Crop Prices and Production Costs

Expected prices were defined as the average price received by Texas farmers for the specified crop between 1958-1976 adjusted to 1977 dollars by the index of prices paid for production items. A twenty year price series was used in order to arrive at as stable a set of long run price relationships as possible while at the same time tying prices to production costs.

Table 5 lists the production cost data. This production cost information was developed from a set of 1977 crop budgets for the

Table 5. Crop Production Cost and Input Data. [a/]

Crop	Pre-harvest Costs ($/acre)	Harvest Costs ($/acre)	Equipment Depreciation Costs ($/acre)	Price Per Unit ($)	Pre-harvest Machinery and Labor Costs [b/]	Insecticide Costs [b/] ($/acre)	Herbicide Costs[b/] ($/acre)	Fertilization Rates (lbs./acre) N	Fertilization Rates (lbs./acre) P
Dryland									
Cotton	52.86	21.87	18.24	00.52/lb lint 00.05/lb seed	31.67	6.00	7.20	40	20
Grain Sorghum	29.20	11.75	11.70	3.65/cwt.	22.06	2.50		30	20
Wheat, Small Grains	30.27	10.72	13.43	3.36/bu. 14.73/AUM	15.76	4.50		40	20
Hay or Pasture	31.53	62.43	8.62	45.00/ton	18.06			50	
Range	2.28		4.27	14.73/AUM	.32		.50	5	
Irrigated									
Cotton	130.23	45.80	41.85	00.52/lb lint 00.05/lb seed	84.60	8.72	10.18	60	20
Grain Sorghum	99.75	18.00	34.04	3.65/cwt.	72.04	3.00		40	20
Wheat, Small Grains	93.58	14.50	42.00	3.36/bu. 14.73/AUM	60.71	3.50		100	40

[a/] Adapted from Parker, Cecil A. and Ray W. Sammons. Texas Crop Budgets. Texas Agricultural Extension Service, College Station, Texas 1977. Budgets for the Rolling Plains Region.

[b/] These costs are included in the pre-harvest variable costs given in column 1.

Rolling Plains Land Resource Area prepared by the Texas Agricultural Extension Service. Basic cost data was modified to fit each soil mapping unit as part of the computer simulation. The modification included: (a) changing harvest costs proportional to yield for that crop for each rotation; and (b) adding appropriate costs of specified conservation practice. As yield is reduced due to effects of soil erosion, harvest cost per acre is proportionally reduced but preharvest costs and equipment costs remain constant.

Four cultural practices were considered in this study. The first is conventional straight row cultivation (denoted "SR" in the tables). This practice was used as the standard method on which production cost and yield data was based.

A second cultural practice, which is gaining increased popularity in this area, called limited or conservation tillage (denoted "C" in the tables), was selected to demonstrate possible savings over time due to reduced machinery and labor usage. For purposes of this study, soil loss due to this cultural practice were assumed to be equal to the soil loss under straight row cultivation. Differences were restricted to production cost savings pertaining principally to use of labor and machinery in field preparation and cultivation. Based on some preliminary studies done at the Texas Agricultural Experiment Station, Bushland, Texas by Allen, Musick and Wiese and by the Perry Foundation in the Rio Grande Valley a ten percent reduction in preharvest machinery and labor costs were assumed for this cultural practice.

Two cultural practices that include contouring and terraces were also considered. Standard terraces (denoted in the tables as "ST"), were defined as terraces that are built from both the front and the back sides and follow the contour of the land without involving substantial cutting and filling. It was assumed that standard terraces could be built for seven cents per linear foot and would have a life expectancy of 10 years. After 10 years, the terrace would have to be rebuilt at a cost of five cents per linear foot.

Parallel terraces (denoted "PT" in the tables) are defined as terraces built from the back side with at least one-third of the terrace interval smoothed and floated in. This not only reduces the slope length but also, partially reduces the steepness of the slope by leveling the interval to some extent. Thus parallel terracing results in a lower Universal Soil Loss Equation "LS" value than standard terraces. Cutting and filling is involved so the contour of the land is not necessarily adhered to exactly. Parallel terraces were assumed to cost twenty-five cents per linear foot to build. Their life expectancy was set at 15 years after which they would have to be rebuilt at a cost of ten cents per linear foot.

The steepness of the slope as well as the type of crop grown affects the number of linear feet of terrace needed per acre. The steeper the slope the narrower the terrace interval must be to be effective. Also the terrace spacing must be closer for row crops than for close grown crops. These cost considerations were combined to arrive at the terrace construction costs listed by soil mapping unit in table 6.

To calculate the production cost of crop rotations grown on terraced soils for each year the base cost for that year was increased by the discounted sum of the initial construction cost plus the cost of rebuilding the terrace as necessary plus an increase in pre-harvest machinery and labor costs of 15 percent for standard terraces or 10 percent for parallel terraces. Machinery and labor costs were increased to cover the cost of the added field time necessary to farm with the contour of the terraces and to deal with point rows and corners created with standard terraces.

Crop Rotations

Crop rotations rather than continuous single crops were considered in this study for two reasons. One reason is that the previous crop influences the amount of erosion from the current crop, and the average erosion rate for a rotation is not a simple average of the erosion rates of the same crops grown continuously. The second reason that rotations were considered is that the yield of some crops will be higher (or lower) when grown in rotation with another crop, or crops.

Table 7 lists the crop rotations that were considered and the yield changes assumed for the cropping combinations. The yield reduction of crops grown in continuous cultivation rather than as part of a crop rotation was based on research conducted at the Texas Research Foundation, Renner, Texas in the 1950's and early 1960's and on the opinion of experienced agronomists familiar with the area. The

Table 6. Terracing Costs, Average Topsoil Thickness and Yield Loss Equation by Soil Mapping Unit.

Soil	Average Topsoil Thickness (in.)	Yield Loss Equation	Terrace Construction Cost For: Standard Terraces, Close Grown Crops ($/ac.)	Standard Terraces, Row Crops ($/ac.)	Parallel Terraces, Close Grown Crops ($/ac.)	Parallel Terraces, Row Crops ($/ac.)
AC01	8	B	10.16	12.19	34.85	41.81
AC13	8	B	17.42	20.33	59.74	69.70
AFSL	8	B	10.16	12.19	34.85	41.81
BFFS	26	B	10.16	12.19	34.85	41.81
CYAL	8	C	10.16	12.19	34.85	41.81
CM13	10	B	17.42	20.33	59.74	69.70
CM35	8	B	26.98	30.49	92.52	104.54
CWLM	6	A	10.16	12.19	34.85	41.81
LROC	4	A	10.16	12.19	34.85	41.81
LYAL	12	C	10.16	12.19	34.85	41.81
MGCY	10	C	10.16	12.19	34.85	41.81
MK01	8	B	10.16	12.19	34.85	41.81
MK13	8	B	17.42	20.33	59.74	69.70
MK35	8	B	26.98	30.49	92.52	104.54
MM01	6	A	10.16	12.19	34.85	41.81
MM13	6	A	17.42	20.33	59.74	69.70
MN01	8	B	10.16	12.19	34.85	41.81
MO03	16	B	17.42	20.33	59.74	69.70
MO35	12	B	26.98	30.49	92.52	104.54
OC01	10	B	10.16	12.19	34.85	41.81
OC13	8	B	17.42	20.33	59.74	69.70
PTSS	6	A	33.14	36.74	113.64	125.95
RCCY	40	C	10.16	12.19	34.85	41.81
RHBL	4	A	33.14	36.74	113.64	125.95
RW01	8	B	10.16	12.19	34.85	41.81
RW13	6	B	17.42	20.33	59.74	69.70
SA13	8	B	17.42	20.33	59.74	69.70
SA35	6	B	26.98	30.49	92.52	104.54
SL35	6	A	26.98	30.49	92.52	104.54
SCYL	12	C	10.16	12.19	34.85	41.81
SY01	10	C	10.16	12.19	34.85	41.81
SY13	8	C	17.42	20.33	59.74	69.70
TFSD	9	C	30.49	33.88	104.54	116.16
US01	12	B	10.16	12.19	34.85	41.81
US13	10	A	17.42	20.33	59.74	69.70
VS13	6	C	17.42	20.33	59.74	69.70
VBCX	4	C	10.16	12.19	34.85	41.81
WC13	8	B	17.42	20.33	59.74	69.70

Table 7. Crop Rotations Considered in the Analysis, Associated USLE "C" Factors and Percent Reduction in Yield Under Continuous Cultivation Rather than in Rotation.

Cropping System and Yield Change [a]	Table Abbreviation	"C" Factor
Cotton (-23)	C	.65
Grain Sorghum (-12)	S	.50
Wheat (-9)	W	.15
Hay or Pasture	P	.02
Range	R	.03
Cotton (-5)/Sorghum (-2)	C/S	.55
Cotton (-5)/Wheat	C/W	.40
Sorghum (-2)/Wheat	S/W	.25
Cotton/Sorghum/Wheat	C/S/W	.35

[a] Yield change is equal to the percent change in yield for each crop in the cropping system compared to the yield listed for that crop in table 4.

yield of cotton grown continuously was reduced twenty-three percent as the crop budget and yield information on cotton was given for cotton in rotation with grain sorghum and small grains. Continuous cotton would not benefit from the plant nutrient carryover or organic residue left by the small grain crop in a rotation or from the cotton pest and disease control provided with sorghum in the rotation. Thus over time expected cotton yield would be less. Cotton grown in rotation with sorghum was penalized five percent due to the fact that while sorghum would provide some opportunity for pest management and some fertility carryover, it would not be as great as the carryover with small grains in the rotation. The yield of cotton in a three year rotation was not decreased. Sorghum yields were decreased two percent in two year rotations and twelve percent in continuous cultivation. This yield decrease is attributable to the lack of Johnsongrass control and fertility carryover in continuous cultivation.

Soil Loss Factors

The Universal Soil Loss Equation was used to calculate average soil loss per acre for each soil series--crop rotation--conservation practice combination in the watershed. This equation is:

$$A = RK(LS)CP$$

where A is gross erosion in tons per acre, R is a rainfall erosivity index, K is a soil-erodibility factor, LS is a topographic factor that represents the combined effects of slope length and steepness, C is a cover and management factor, and P is a conservation practice factor. Values for all of these factors were furnished by the Soil Conservation Service and are reported in tables 7 and 8. It should be noted that the LS value does not represent an average value for the soil. Rather it is a value assigned to a specific slope length and slope percent. These specific slope characteristics can commonly be found for that soil mapping unit. Also shown in table 8 are the erosion tolerance limits, or "T" values, that have been established for each soil. Theoretically, if erosion is less than this T value, little or no yield reduction results from the soil loss.

Table 9 shows estimated per acre erosion rates for each soil series--conservation practice--crop rotation combination considered in the study.

An overview of data in table 9 leads to several general conclusions about the soil loss problems in Mitchell County. It is apparent that most soils have only a low to moderate potential for soil loss, with the major crop of concern being cotton. A few soil mapping units, for example Rough Broken Land or Potter soils seem to have a fairly high potential for soil erosion especially if planted to row crops but these mapping units are never used for cropland and hence these potential soil losses are never realized. Another general conclusion one can derive from table 9 is that soil loss for any particular soil mapping unit can be reduced by either changing to a close grown crop or by terracing and contouring. The better way, if soil losses must be reduced, depends on

Table 8. USLE Factors by Soil Mapping Unit for Mitchell County.

Soil	USLE Factors					
	K	LS Without Terraces	LS With Standard Terraces	LS With Parallel Terraces	P Contouring-Terracing	T (Ton/Ac/Yr)
AC01	0.32	0.12	0.12	0.12	0.6	5
AC13	0.32	0.27	0.22	0.20	0.6	5
AFSL	0.24	0.12	0.12	0.12	0.6	5
BFFS	0.24	0.22	0.22	0.22	0.6	5
CYAL	0.32	0.09	0.09	0.09	0.6	5
CM13	0.32	0.27	0.22	0.20	0.6	2
CM35	0.32	0.52	0.40	0.36	0.5	2
CWLM	0.32	0.11	0.11	0.11	1.0	1
LRCC	0.24	0.14	0.14	0.14	1.0	1
LYAL	0.28	0.12	0.12	0.12	0.6	5
MGCY	0.32	0.11	0.11	0.11	0.6	5
MK01	0.28	0.12	0.12	0.12	0.6	3
MK13	0.28	0.24	0.22	0.21	0.6	3
MK35	0.28	0.37	0.37	0.37	1.0	3
MM01	0.32	0.12	0.12	0.12	0.6	1
MM13	0.32	0.25	0.22	0.21	0.6	1
MN01	0.32	0.12	0.12	0.12	0.6	5
MO03	0.20	0.24	0.22	0.21	0.6	5
MO35	0.20	0.57	0.57	0.57	0.5	5
OC01	0.32	0.12	0.12	0.12	0.6	5
OC13	0.32	0.27	0.22	0.20	0.6	5
PTSS	0.28	1.93	1.93	1.93	1.0	1
RCCY	0.32	0.12	0.12	0.12	0.6	5
RHBL	0.32	2.10	2.10	2.10	1.0	3
RW01	0.32	0.12	0.12	0.12	0.6	5
RW13	0.32	0.27	0.22	0.20	0.6	5
SA13	0.24	0.25	0.22	0.21	0.6	2
SA35	0.24	0.39	0.29	0.26	0.5	2
SL35	0.24	0.52	0.52	0.52	1.0	2
SCYL	0.28	0.16	0.16	0.16	0.6	5
SY01	0.32	0.14	0.14	0.14	0.6	4
SY13	0.32	0.15	0.15	0.15	0.6	4
TFSD	0.17	0.65	0.65	0.65	1.0	5
US01	0.28	0.12	0.12	0.12	0.6	4
US13	0.28	0.24	0.22	0.21	0.6	4
VS13	0.32	0.20	0.20	0.20	1.0	2
VBCX	0.32	0.20	0.20	0.20	1.0	2
WC13	0.32	0.20	0.20	0.20	0.6	3

TABLE 9. EXPECTED SOIL LOSS (TONS/ACRE/YEAR) FOR EACH CROP ROTATION, SOIL MAPPING UNIT, AND CULTURAL PRACTICE.

SOIL	CP	COTTON	SORGHUM	WHEAT	P/W	RANGE	C/S	C/W	S/W	C/S/W
AC01	SR	3.49	2.69	0.81	0.11	0.16	2.96	2.15	1.34	1.88
AC13	SR	7.86	6.05	1.81	0.24	0.36	6.65	4.84	3.02	4.23
	ST	3.84	2.96	0.89	0.12	0.16	3.25	2.37	1.48	2.07
	PT	3.55	2.73	0.82	0.11	0.16	3.01	2.19	1.37	1.91
AFSL	SR	2.62	2.02	0.60	0.08	0.12	2.22	1.61	1.01	1.41
BFFS	SR	4.80	3.70	1.11	0.15	0.22	4.07	2.96	1.85	2.59
CYAL	SR	2.62	2.02	0.60	0.08	0.12	2.22	1.61	1.01	1.41
CM13	SR	7.86	6.05	1.81	0.24	0.36	6.65	4.84	3.02	4.23
	ST	3.84	2.96	0.89	0.12	0.16	3.25	2.37	1.48	2.07
	PT	3.55	2.73	0.82	0.11	0.16	3.01	2.19	1.37	1.91
CM35	SR	15.14	11.65	3.49	0.47	0.70	12.81	9.32	5.82	8.15
	ST	5.82	4.48	1.34	0.18	0.27	4.93	3.58	2.24	3.14
	PT	5.24	4.03	1.21	0.16	0.24	4.44	3.23	2.02	2.82
CWLM	SR	3.20	2.46	0.74	0.10	0.15	2.71	1.97	1.23	1.72
LRDC	SR	3.06	2.35	0.71	0.09	0.14	2.59	1.88	1.18	1.65
LYAL	SR	3.06	2.35	0.71	0.09	0.14	2.59	1.88	1.18	1.65
MGCY	SR	3.20	2.46	0.74	0.10	0.15	2.71	1.97	1.23	1.72
MK01	SR	3.06	2.35	0.71	0.09	0.14	2.59	1.88	1.18	1.65
MK13	SR	6.12	4.70	1.41	0.19	0.28	5.17	3.76	2.35	3.29
	ST	3.36	2.59	0.78	0.10	0.16	2.85	2.07	1.29	1.81
	PT	3.26	2.51	0.75	0.10	0.15	2.76	2.01	1.25	1.76

TABLE 9. (CONTINUED).
EXPECTED SOIL LOSS (TONS/ACRE/YEAR) FOR EACH CROP ROTATION, SOIL MAPPING UNIT, AND CULTURAL PRACTICE.

SOIL	CP	COTTON	SORGHUM	WHEAT	P/H	RANGE	C/S	C/W	S/W	C/S/W
MK35	SR	9.43	7.25	2.13	0.29	0.44	7.98	5.80	3.63	5.08
MM01	SR	3.49	2.69	0.81	0.11	0.16	2.96	2.15	1.34	1.88
MM13	SR	7.28	5.60	1.68	0.22	0.34	6.16	4.48	2.80	3.92
	ST	3.84	2.96	0.89	0.12	0.18	3.25	2.37	1.48	2.07
	PT	3.67	2.82	0.85	0.11	0.17	3.10	2.26	1.41	1.98
MN01	SR	3.49	2.69	0.81	0.11	0.16	2.96	2.15	1.34	1.88
MO03	SR	4.37	3.36	1.01	0.13	0.20	3.70	2.69	1.68	2.35
	ST	2.40	1.85	0.55	0.07	0.11	2.03	1.48	0.92	1.29
	PT	2.33	1.79	0.54	0.07	0.11	1.97	1.43	0.90	1.25
MO35	SR	10.37	7.98	2.39	0.32	0.48	8.78	6.38	3.99	5.59
OC01	SR	3.49	2.69	0.81	0.11	0.16	2.96	2.15	1.34	1.88
OC13	SR	7.86	6.05	1.81	0.24	0.36	6.65	4.84	3.02	4.23
	ST	3.84	2.96	0.89	0.12	0.18	3.25	2.37	1.48	2.07
	PT	3.55	2.73	0.82	0.11	0.16	3.01	2.19	1.37	1.91
PTSS	SR	49.18	37.83	11.35	1.51	2.27	41.61	30.26	18.91	26.48
RCCY	SR	3.49	2.69	0.81	0.11	0.16	2.96	2.15	1.34	1.88
RHBL	SR	61.15	47.04	14.11	1.88	2.82	51.74	37.63	23.52	32.93
RW01	SR	3.49	2.69	0.81	0.11	0.16	2.96	2.15	1.34	1.88
RW13	SR	7.86	6.05	1.81	0.24	0.36	6.65	4.84	3.02	4.23
	ST	3.84	2.96	0.89	0.12	0.18	3.25	2.37	1.48	2.07
	PT	3.55	2.73	0.82	0.11	0.16	3.01	2.19	1.37	1.91

TABLE 9. (CONTINUED).
EXPECTED SOIL LOSS (TONS/ACRE/YEAR) FOR EACH CROP ROTATION, SOIL MAPPING UNIT, AND CULTURAL PRACTICE.

SOIL	CP	COTTON	SORGHUM	WHEAT	P/H	RANGE	C/S	C/W	S/W	C/S/W
SA13	SR	5.46	4.20	1.26	0.17	0.25	4.62	3.36	2.10	2.94
	ST	2.88	2.22	0.67	0.09	0.13	2.44	1.77	1.11	1.55
	PT	2.75	2.12	0.64	0.08	0.13	2.33	1.69	1.06	1.48
SA35	SR	8.52	6.55	1.97	0.26	0.39	7.21	5.24	3.28	4.59
	ST	3.17	2.44	0.73	0.10	0.15	2.68	1.95	1.22	1.71
	PT	2.80	2.16	0.65	0.09	0.13	2.37	1.72	1.08	1.51
SL35	SR	11.36	8.74	2.62	0.35	0.52	9.61	6.99	4.37	6.12
SCYL	SR	4.08	3.14	0.94	0.13	0.19	3.45	2.51	1.57	2.20
SY01	SR	4.08	3.14	0.94	0.13	0.19	3.45	2.51	1.57	2.20
SY13	SR	4.37	3.36	1.01	0.13	0.20	3.70	2.69	1.68	2.35
TFSD	SR	10.06	7.73	2.32	0.31	0.46	8.51	6.19	3.87	5.41
US01	SR	3.06	2.35	0.71	0.09	0.14	2.59	1.88	1.18	1.65
US13	SR	6.12	4.70	1.41	0.19	0.28	5.17	3.76	2.35	3.29
	ST	3.36	2.59	0.78	0.10	0.16	2.85	2.07	1.29	1.81
	PT	3.26	2.51	0.75	0.10	0.15	2.76	2.01	1.25	1.76
VS13	SR	5.82	4.48	1.34	0.18	0.27	4.93	3.58	2.24	3.14
VBCX	SR	5.82	4.48	1.34	0.18	0.27	4.93	3.58	2.24	3.14
WC13	SR	5.82	4.48	1.34	0.18	0.27	4.93	3.58	2.24	3.14

relative net returns to the two methods. The soil loss any one year does not directly affect that year's net returns to a particular crop rotation at the low levels of soil loss normally to be expected in Mitchell County. However, over time the loss of topsoil does become important because the yield of the crops grown is effected.

Yield Loss Attributal to Erosion

In a long-run analysis of soil conservation the relationship between erosion and future crop yield is critical. This is because the on-farm benefits from conservation practices arise mainly from the relatively higher future crop yield resulting from that conservation practice. Unfortunately, very little experimental or field data on this important relationship are available. Consequently, for purposes of this study it was necessary to develop estimates of this relationship for each soil mapping unit.

Yield loss attributal to topsoil loss depends to a certain extent on the suitability of the subsoil for crop production. Soils in the watershed were classified into one of three groups. Group A consists of soils that have subsoil that is unsuitable for field crop production. For this group, crop yield was assumed to be zero after all topsoil was eroded. Group B consists of soils with subsoils that are slightly suitable for field crop production. It was assumed that crop yield on Group B soils would be 25 percent of the currently attainable yield after all the topsoil was eroded away. Group C consists of those soils with subsoils that are somewhat more suitable for crop production. After the loss of all topsoil, yield in this group was assumed to be 50 percent of present yield. The group to which each soil belongs and initial average topsoil depth for each soil is shown in table 6.

Due to paucity of experimental or field data on the relationship between topsoil thickness and yield, it was necessary to subjectively specify this relationship for each soil group. After considerable discussion with Soil Conservation Service and Texas A&M University scientists, the three relationships shown in figure 2 were specified. The functions in figure 2 have two important characteristics. One is that each function is expressed in terms of percent of topsoil lost and percent of initial yield attainable after erosion. This reflects the fact that the loss of one inch on an initially shallow soil will decrease yield more than the loss of one inch of an initially deep soil. For example, the loss of one inch of a soil in Group A with an initial depth of 20 inches will reduce yield by about 2 percent, while the loss of one inch on a soil with an initial depth of 5 inches will decrease yield by about 8 percent.

The second important characteristic of the functions in figure 2 is that the loss of the last remaining topsoil will reduce yield by more than the loss of the upper portions of initial topsoil. For instance, the loss of the first 20 percent of topsoil in Group A will reduce yield by about 8 percent, while the loss of the last 20 percent of topsoil will reduce yield by about 46 percent. Because of the critical nature of the relationships shown in figure 2, additional experi-

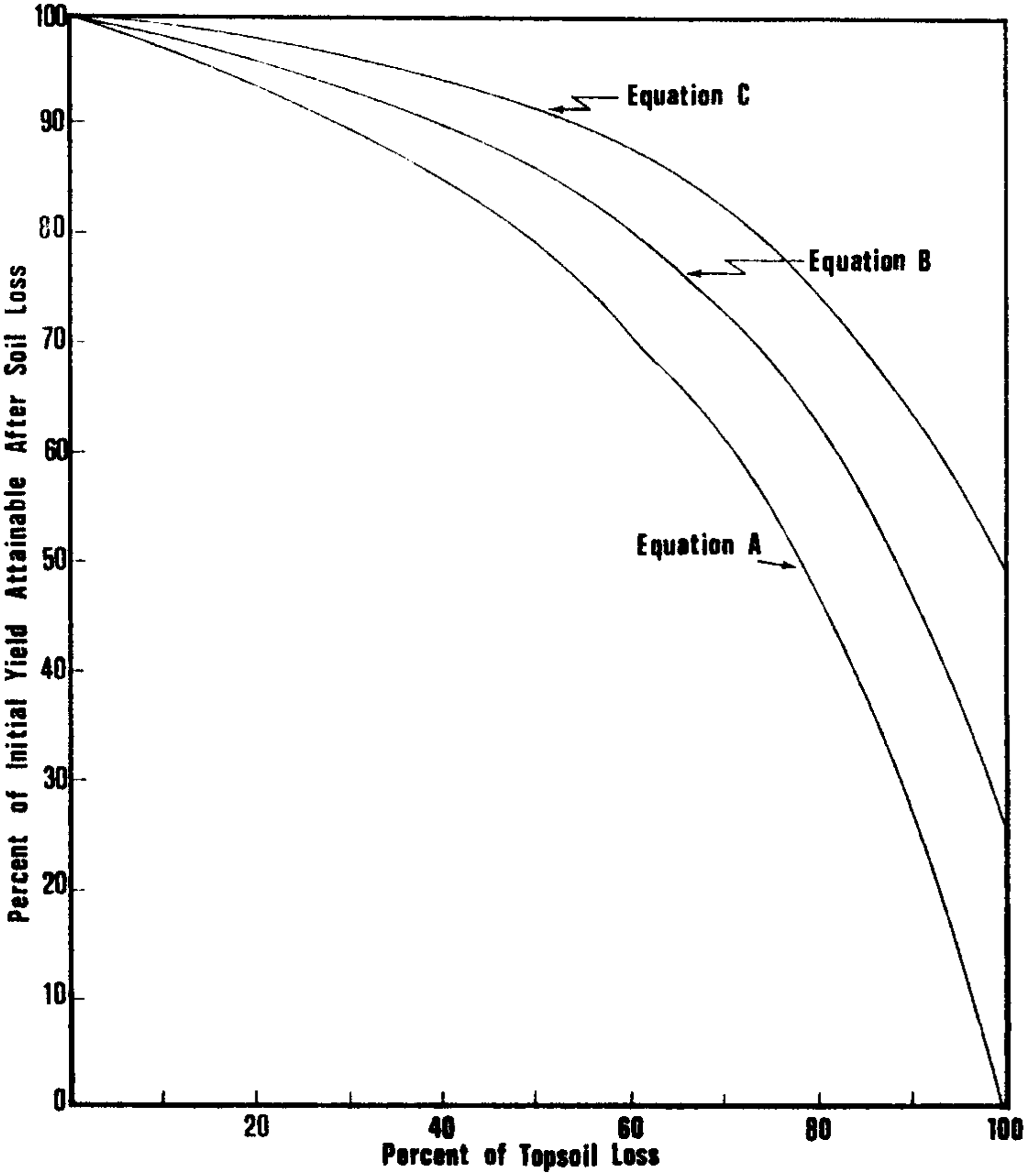

Figure 2. Relationships between yield and topsoil eroded

mental and field research appears warranted.

In determining effects of erosion on yield, bulk density of soil is important. Since erosion typically occurs when the soil is saturated with water, the bulk density of wet soil was used. Based on unpublished field data, a bulk density of 200 tons per acre inch was used for all soils in Mitchell County except the clay soils. A bulk density of 180 tons per acre inch was used for the clay soils which include; Mangum clay, Roscoe clay and Stamford and Dalby clays.

Profitability of Conservation Practices

Profitability information for the various crop rotation--conservation practice combinations for each soil in the Mitchell County is given in Appendix A, tables 12 through 49. All figures are based on assumptions previously stated. All on-farm costs associated with the conservation practice of terracing are included when their profitability is calculated, but there is no Federal cost sharing for terrace construction added in nor is there any cost charged for sediment leaving fields.

As an illustration of information given in these tables, consider table 37 which gives the data for Rowena clay loam on 1-3 percent slopes.

The first column of this table gives the crop rotations considered for this soil, while the second column lists the conservation practice. Column 3 gives the estimated percent of topsoil lost annually for each respective crop rotation --conservation practice combination. In column 4 expected per acre return to land and management in year 1 is given. The next block of columns gives annual yield as a percent of initial yield, and expected profit for years 10, 100, and 200. The final block of columns gives the present value of a profit stream to year 10, 100, and 200.

As a specific example consider continuous cotton on Rowena clay loam with 1-3 percent slope (table 37). Given the assumed initial topsoil thickness of 6 inches (table 6), with straight row or limited till cultivation, .656 percent of the topsoil would be lost annually. If terraces are constructed the yearly percentage loss in topsoil thickness is reduced to .321 percent with standard terraces or .297 percent if parallel terraces are constructed.

The profit from continuous cotton would be $15.25 the first year with straight row tillage. This profit would get progressively less as the topsoil was lost and yield decreased so that by the 200th year,profit with straight row tillage would have dropped to -$49.39. Yield losses due to topsoil erosion remains the same with limited tillage methods but the reduced use of machinery and labor results in higher profits for any one year. The use of terraces cut yearly topsoil losses by more than one-half resulting in higher yields for any particular year. In the long run, one-hundred years or more, these higher yields result in higher returns to land and management. On the other hand, higher costs associated with terrace construction and maintenance causes short-run returns to be less than without terraces despite the yield differences. Thus growing continuous cotton on Rowena clay loam (table 37) causes sufficient topsoil erosion to reduce yields in the 100th year to 73 percent of initial yield if straight row or conservation tillage cultivation is employed. A yield reduction of this magnitude causes the yearly return to land and management to be -\$7.69 for straight row cultivation and -\$4.52 for conservation tillage, but the present value of the profit stream to year 100 for these methods of cultivation would be \$440 and \$603, respectively. If parallel terraces were constructed the yield would only be reduced to 91.3 percent in the 100th year and a return of \$1.99 per acre would be expected. However, the present value of the profit stream to year 100 with parallel terraces would be only \$325 -- less than that under either straight row or conservation tillage cultivation. The present value of topsoil saving terracing systems does not become larger than that of the non-terracing methods until well past 100 years.

Many of the soils in Mitchell County are too flat for contouring and terracing to have any effect on the rate of soil loss. For these soils only the straight row and conservation tillage cultivation practices are listed. Also, only appropriate crops for a given soil are listed. Thus, a few soil mapping units such as Rough Broken Land have no field crop options and are listed only for completeness.

Nine soil mapping units have potential for irrigation. Expected yields for crops under irrigation are listed as part of table 4. On these soils profit and yield information is also given for the irrigated rotations as it is for example in table 12.

Information in tables 12 through 49 can also be used to compare the profitability of the four cultural practices for a particular crop or the profitability of the various crop rotation-cultural practices for each soil mapping unit, given a planning horizon of 10, 100 or 200 years. Table 10 lists the cultural practice with the highest present value of profit for a 200 year planning horizon for every crop rotation on each soil mapping unit in the county. Only the 200 year planning horizon is shown because there was very little difference over the various time horizons and the information is available within tables 12 through 49. The contents of table 10 indicate that very little if any terracing is profitable in Mitchell county unless government cost-sharing programs are involved. Typical fields from which the soil mapping unit data in this study was taken were simply too flat to pay for expensive terrace construction if only the profit lost due to yield reduction is considered.

Naturally this does not mean that there are no fields in the county that can be profitably terraced. There may be many areas that are steeper or have longer slopes than the typical just as there may be many farmers who have different costs of production and expected yields. Table 11 lists the most profitable crop rotation -- cultural practice combination for each soil mapping unit for each of the three planning horizons considered. A cotton-wheat rotation is the preferred dryland crop rotation on most of the soils that will support crop production. This is apparently due to the high profitability associated with cotton combined with the yield conserving properties

Table 10. Most Profitable Conservation Practice by Soil Mapping Unit and Crop Rotation with 200 Year Planning Horizon. [a/]

Soil	Crop Rotation							
	C	S	W	P/H	C/S	C/W	S/W	C/S/W
AC01	C	C	C	SR	C	C	C	C
AC13	C	C	C	SR	C	C	C	C
AFSL	C	C	C	SR	C	C	C	C
BFFS	C	C	–	SR	C	–	–	–
CYAL	C	C	C	SR	C	C	C	C
CM13	C	C	C	SR	C	C	C	C
CM35	PT	C	C	SR	C	C	C	C
CWLM	–	–	–	–	–	–	–	–
LROC	–	–	–	–	–	–	–	–
LYAL	C	C	C	SR	C	C	C	C
MGCY	C	C	C	SR	C	C	C	C
MK01	C	C	C	SR	C	C	C	C
MK13	C	C	C	SR	C	C	C	C
MK35	–	–	–	SR	–	–	–	–
MM01	C	C	C	SR	C	C	C	C
MM13	TZ	C	C	SR	TZ	C	C	C
MN01	C	C	C	SR	C	C	C	C
MO03	C	C	C	SR	C	C	C	C
MO35	–	–	–	–	–	–	–	–
OC01	C	C	C	SR	C	C	C	C
OC13	C	C	C	SR	C	C	C	C
PTSS	–	–	–	–	–	–	–	–
RCCY	C	C	C	SR	C	C	C	C
RHBL	–	–	–	–	–	–	–	–
RW01	C	C	C	SR	C	C	C	C
RW13	PT	C	C	SR	C	C	C	C
SA13	C	C	C	SR	C	C	C	C
SA35	–	C	C	SR	–	–	C	–
SL35	–	–	–	–	–	–	–	–
SCYL	C	C	C	SR	C	C	C	C
SY01	C	C	C	SR	C	C	C	C
SY13	C	C	C	SR	C	C	C	C
TFSD	–	–	–	–	–	–	–	–
US01	C	C	C	SR	C	C	C	C
US13	C	C	C	SR	C	C	C	C
VS13	–	–	–	–	–	–	–	–
VBCX	–	–	–	–	–	–	–	–
WC13	C	C	C	SR	C	C	C	C

[a/] C denotes Conservation tillage,
PT denotes parallel terracing, TZ means yield is zero in year 200 for all practices except terracing.

Table 11. Crop Rotation--Cultural Practice Combinations with Highest Present Value for Planning Horizons of 10, 100, and 200 Years for Each Soil Mapping Unit.

Soil	Planning Horizon					
	10		100		200	
	Rotation	Cultural Practice	Rotation	Cultural Practice	Rotation	Cultural Practice
AC01	C/W	C	C/W	C	C/W	C
Irrigated	C	C	C	C	C	C
AC13	C/W	C	C/W	C	C/W	C
Irrigated	C	C	C	C	C/S	C
AFSL	C	C	C	C	C/W	C
BFFS	P/H	SR	P/H	SR	P/H	SR
CYAL	C/W	C	C/W	C	C/W	C
CM13	C/W	C	C/W	C	C/W	C
Irrigated	C/S/W	C	C/S/W	C	C/S/W	C
CM35	P/H	SR	P/H	SR	P/H	SR
CWLM	-	-	-	-	-	-
LROC	-	-	-	-	-	-
LYAL	C/W	C	C/W	C	C/W	C
MGCY	C/W	C	C/W	C	C/W	C
MK01	R	SR	R	SR	R	SR
MK13	R	SR	R	SR	R	SR
MK35	R	SR	R	SR	R	SR
MM01	C/W	C	C/W	C	C/W	C
MM13	R	SR	R	SR	R	SR
MN01	C/W	C	C/W	C	C/W	C
Irrigated	C	C	C	C	C	C
MO03	C/W	C	C/W	C	C/W	C
Irrigated	C	C	C	C	C	C
MO35	R	SR	R	SR	R	SR
OC01	C/W	C	C/W	C	C/W	C
OC13	C/W	C	C/W	C	P/H	SR
PTSS	-	-	-	-	-	-
RCCY	C/W	C	C/W	C	C/W	C
RHBL	-	-	-	-	-	-
RW01	C/W	C	C/W	C	C/W	C
RW13	C/W	C	C/W	C	C/W	C
SA13	P/H	SR	P/H	SR	P/H	SR
SA35	-	-	-	-	-	-
SCYL	C/W	C	C/W	C	C/W	C
Irrigated	C	C	C	C	C	C
SY01	C/W	C	C/W	C	C/W	C
SY13	P/H	SR	P/H	SR	P/H	SR
TFSD	R	SR	R	SR	R	SR
US01	C/S	C	C/S	C	C/S	C
US13	C/S	C	C/S	C	C/S	C
VS13	R	SR	R	SR	R	SR
VBCX	R	SR	R	SR	R	SR
WC13	P/H	SR	P/H	SR	P/H	SR

of wheat. Many of the soil mapping units, particularly those which are highly susceptible to soil erosion are confined to native rangeland or permanent pasture.

All the soil mapping units which can be profitably irrigated show their highest present value with continuous cotton or a rotation which includes cotton. The large yield increases that are possible with irrigated cotton are the major cause for this shift to continuous cotton in spite of the soil loss and other associated problems.

Cost-Sharing for Terrace Construction Cost

Profitability estimates for conservation practices shown in appendix A, tables 12 through 49, were based on the assumption that farmers would pay the full cost of adopting a conservation practice. The Agricultural Stabilization and Conservation Service presently makes a limited number of payments to farmers for 50 percent of the initial cost of constructing terraces. This type of payment would obviously make terracing a more attractive alternative. To determine if this would make terracing more profitable than contouring or straight row farming, one can determine the amount of such a payment by taking 50 percent of the appropriate terrace cost figure in table 6 and add it to the present value figures (tables 12 through 49).

There are only a few instances where 50 percent cost-sharing payments would make terracing profitable where it would not otherwise be profitable. However, the payments may induce farmers to terrace where it is already profitable because such payments greatly ease the initial financial burden associated with constructing terraces. Also since this model must of necessity deal in average conditions, it may be that certain fields could be profitably terraced with the construction assistance even though the average soil mapping unit could not. Therefore, cost sharing for conservation practices may have a greater impact than would be indicated by the profitability calculations shown in tables 12 through 49.

SUMMARY AND CONCLUSIONS

When an attempt is made to model an activity as complex as agricultural production the decisions made at two points in the modeling process are of crucial importance. One is the type and level of inputs to assume and the second is the appropriate mathematical analogues for the major forces shaping those inputs.

The inputs assumed in this model were average long run cost and price relationships, average yield with high level of management and average environmental and climatic conditions for this area. These averages were based on historical data and hence imply an assumption of relative stability, with the future being a continuation of the past. Another assumption of the model is that the decision maker is a profit maximizer and hence always attempts to minimize costs for a given level of output or maximize output given a cost ceiling.

Given the inputs assumed and the overall drive of profit maximization the accuracy of the model's predictions are mainly dependent on three relationships built into the model.

The first is the relationship between climatic conditions and the environment specified by the Universal Soil Loss Equation. Though this equation has been criticized, it is the best available estimator at this time. Nonetheless, the poorer its accuracy the greater is the deviation of predicted soil loss from the actual soil loss that would occur under the given conditions.

The second crucial relationship in the model is that between soil loss and yield change. Since there is no cost associated with soil loss in the model other than the yield reduction it causes, the topsoil loss--yield reduction functions are the essential link that places a monetary value on soil erosion. The higher the yield reduction assumed for each unit of soil lost, the greater the value of that soil and hence the more soil conservation is warranted.

The third relationship with major impact on the model results is the discount rate assumed for future profits. The present value of activities such as terracing which have high present costs but whose benefits occur many years later, are greatly affected by the discount rate. As the discount rate is increased the importance of future returns decrease. Therefore, the lower the discount rate chosen the greater the importance of future returns and hence of profit conserving soil loss reductions.

Given the difficulty of input data accuracy and the variation in output possible by manipulating the key relationships it is clear that the specific numbers reported herein should not be taken literally. Rather they should be viewed as the best estimates possible given the limitations of the model. Nonetheless, it is the opinion of the authors that the results are sufficiently accurate to specify the relative merits of the crop rotation--cultural practice combinations for controlling soil erosion and enhancing long-run profits.

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APPENDIX A

Profit and Yield Information by Soil Mapping Units for 10, 100 and 200 Year Planning Horizons

TABLE 12. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES AC01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.219	5.78	98.9	5.25	93.4	0.98	86.4	-4.39	51.	197.	187.
	C	0.219	8.94	98.9	8.41	93.4	4.14	86.4	-1.22	80.	360.	387.
S	SR	0.168	-5.71	99.1	-5.91	94.7	-7.49	90.1	-9.15	-54.	-332.	-427.
	C	0.168	-3.51	99.1	-3.70	94.7	-5.29	90.1	-6.94	-33.	-218.	-287.
W	SR	0.050	11.83	99.5	11.74	98.0	10.89	96.5	10.06	109.	592.	715.
	C	0.050	13.41	99.5	13.32	98.0	12.47	96.5	11.64	123.	673.	815.
P/H	SR	0.007	7.16	99.6	7.15	99.4	7.05	99.2	6.94	66.	367.	449.
R	SR	0.010	2.26	99.6	2.26	99.3	2.23	99.0	2.20	21.	116.	142.
C/S	SR	0.185	11.00	99.0	10.60	94.2	7.37	89.0	3.82	100.	491.	562.
	C	0.185	13.68	99.0	13.29	94.2	10.06	89.0	6.50	124.	630.	732.
C/W	SR	0.135	20.58	99.2	20.24	95.6	17.40	92.0	14.64	188.	996.	1186.
	C	0.135	22.95	99.2	22.62	95.6	19.77	92.0	17.02	210.	1118.	1336.
S/W	SR	0.084	7.95	99.4	7.81	97.0	6.58	94.7	5.43	73.	382.	454.
	C	0.084	9.84	99.4	9.70	97.0	8.48	94.7	7.32	90.	480.	573.
C/S/W	SR	0.118	7.87	99.3	7.68	96.0	6.08	92.9	4.56	72.	369.	433.
	C	0.118	9.71	99.3	9.52	96.0	7.92	92.9	6.40	89.	464.	550.
IRRIGATED CROP ROTATIONS												
C	SR	0.219	175.92	98.9	173.53	93.4	154.20	86.4	129.91	1612.	8624.	10323.
	C	0.219	184.38	98.9	181.99	93.4	162.65	86.4	138.37	1690.	9061.	10858.
S	SR	0.168	56.46	99.1	55.45	94.7	47.04	90.1	38.27	516.	2717.	3227.
	C	0.168	63.67	99.1	62.65	94.7	54.24	90.1	45.47	583.	3089.	3683.
W	SR	0.050	43.15	99.5	42.86	98.0	40.14	96.5	37.46	397.	2167.	2622.
	C	0.050	49.22	99.5	48.93	98.0	46.21	96.5	43.53	453.	2481.	3007.
C/S	SR	0.185	167.42	99.0	165.54	94.2	150.17	89.0	133.25	1536.	8280.	9958.
	C	0.185	175.25	99.0	173.37	94.2	158.01	89.0	141.09	1608.	8684.	10454.
C/S/W	SR	0.118	139.70	99.3	138.62	96.0	129.34	92.9	120.53	1283.	6997.	8464.
	C	0.118	146.87	99.3	145.80	96.0	136.51	92.9	127.71	1350.	7368.	8918.

TABLE 13. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES AC13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.492	-3.90	98.0	-4.90	83.9	-14.43	28.1	-52.10	-41.	-392.	-683.
	C	0.492	-0.73	98.0	-1.73	83.9	-11.26	28.1	-48.93	-11.	-226.	-483.
	ST	0.241	-12.12	98.8	-12.63	92.8	-14.89	84.4	-20.47	-114.	-629.	-820.
	PT	0.222	-17.08	98.9	-17.55	93.3	-14.27	86.1	-18.94	-160.	-607.	-781.
S	SR	0.379	-12.90	98.4	-13.24	88.7	-16.03	63.1	-23.42	-121.	-728.	-941.
	C	0.379	-10.70	98.4	-11.03	98.7	-13.62	63.1	-21.21	-100.	-615.	-801.
	ST	0.185	-19.73	99.0	-19.90	94.2	-19.46	89.0	-20.91	-183.	-958.	-1186.
	PT	0.171	-25.17	99.1	-25.32	94.6	-19.54	89.9	-20.72	-233.	-965.	-1187.
W	SR	0.114	5.65	99.3	5.47	96.1	3.91	93.2	2.44	51.	256.	295.
	C	0.114	7.22	99.3	7.05	96.1	5.49	93.2	4.02	66.	337.	394.
	ST	0.056	0.27	99.5	0.18	97.8	0.91	96.2	0.17	2.	75.	86.
	PT	0.051	-4.55	99.5	-4.64	97.9	0.66	96.4	0.06	-42.	61.	74.
P/H	SR	0.015	7.16	99.6	7.14	99.1	6.91	98.6	6.67	66.	365.	444.
	ST	0.007	1.42	99.6	1.41	99.4	2.85	99.1	2.79	13.	151.	188.
	PT	0.007	-3.28	99.6	-3.29	99.4	2.66	99.2	2.70	-30.	141.	181.
R	SR	0.023	2.26	99.6	2.25	98.9	2.19	98.1	2.12	21.	115.	140.
C/S	SR	0.417	1.04	98.3	0.31	87.3	-6.02	53.5	-25.49	6.	-83.	-219.
	C	0.417	3.73	98.3	2.99	87.3	-3.33	53.5	-22.80	31.	56.	-49.
	ST	0.204	-6.48	99.0	-6.85	93.8	-8.03	87.6	-11.49	-61.	-312.	-416.
	PT	0.188	-11.68	99.0	-12.02	94.2	-7.75	88.8	-10.68	-109.	-304.	-396.
C/W	SR	0.303	11.21	98.6	10.57	91.1	5.38	77.0	-4.34	100.	458.	485.
	C	0.303	13.59	98.6	12.94	91.1	7.75	77.0	-1.97	122.	580.	635.
	ST	0.148	4.16	99.1	3.64	95.2	2.93	91.3	0.31	37.	245.	271.
	PT	0.137	-1.19	99.2	-1.49	95.5	3.03	91.9	0.74	-12.	244.	279.
S/W	SR	0.189	0.54	99.0	0.28	94.1	-1.83	88.7	-4.20	4.	-22.	-54.
	C	0.189	2.43	99.0	2.17	94.1	0.06	88.7	-2.30	21.	75.	66.
	ST	0.093	-5.82	99.3	-5.95	96.7	-5.28	94.2	-6.28	-54.	-233.	-295.
	PT	0.086	-11.42	99.4	-11.53	96.9	-5.53	94.6	-6.36	-106.	-249.	-307.
C/S/W	SR	0.265	2.91	98.7	2.54	92.2	-0.39	81.9	-4.97	25.	81.	59.
	C	0.265	4.75	98.7	4.39	92.2	1.45	81.9	-3.12	42.	176.	176.
	ST	0.130	-3.37	99.2	-3.55	95.7	-3.31	92.3	-4.74	-32.	-117.	-158.
	PT	0.120	-8.99	99.2	-9.16	96.0	-3.55	92.8	-4.77	-84.	-133.	-170.

TABLE 13. (CONTINUED).

IRRIGATED CROP ROTATIONS

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.492	117.64	99.0	113.32	83.9	72.24	28.1	-90.15	1065.	5252.	5561.
	C	0.492	126.10	99.0	121.78	83.9	80.70	28.1	-81.69	1143.	5689.	6096.
	ST	0.241	101.68	98.8	99.49	92.8	83.75	84.4	59.48	928.	4927.	5812.
	PT	0.222	99.38	98.9	97.35	93.3	88.08	86.1	67.38	907.	5108.	6062.
S	SR	0.379	24.59	98.4	22.73	88.7	7.32	63.1	-33.47	218.	925.	871.
	C	0.379	31.78	98.4	29.94	88.7	14.53	63.1	-26.26	285.	1297.	1327.
	ST	0.185	10.35	99.0	9.42	94.2	3.63	89.0	-4.67	91.	448.	459.
	PT	0.171	7.41	99.1	6.55	94.6	6.52	89.9	-0.78	65.	580.	635.
W	SR	0.114	25.24	99.3	24.66	96.1	19.59	93.2	14.79	230.	1186.	1392.
	C	0.114	31.31	99.3	30.73	96.1	25.66	93.2	20.87	286.	1499.	1777.
	ST	0.056	13.14	99.5	12.85	97.8	11.73	96.2	9.18	120.	699.	827.
	PT	0.051	10.57	99.5	10.30	97.9	13.87	96.4	11.58	96.	803.	963.
C/S	SR	0.417	113.77	99.3	110.38	87.3	80.97	53.5	-9.49	1034.	5238.	5878.
	C	0.417	121.61	98.3	119.21	87.3	88.80	53.5	-1.66	1106.	5643.	6373.
	ST	0.204	98.70	99.0	96.98	93.8	84.88	87.6	68.54	902.	4859.	5785.
	PT	0.138	96.08	99.0	94.49	94.2	88.57	88.8	74.29	879.	5018.	6000.
C/S/W	SR	0.265	96.32	98.7	94.31	92.2	78.29	81.9	53.31	879.	4594.	5412.
	C	0.265	103.49	98.7	101.49	92.2	85.46	81.9	60.48	945.	4965.	5866.
	ST	0.130	82.15	99.2	81.14	95.7	74.40	92.3	56.26	753.	4135.	4970.
	PT	0.120	79.20	99.2	78.27	96.0	77.35	92.8	69.93	726.	4268.	5146.

TABLE 14. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES AFSL.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.164	63.46	99.1	62.76	94.8	56.94	90.3	50.94	582.	3139.	3777.
	C	0.164	66.63	99.1	65.92	94.8	60.10	90.3	54.11	611.	3303.	3977.
S	SR	0.126	23.01	99.2	22.75	95.8	20.62	92.5	18.39	211.	1136.	1366.
	C	0.126	25.22	99.2	24.96	95.8	22.73	92.5	20.60	231.	1250.	1505.
W	SR	0.038	24.17	99.5	24.09	98.4	23.30	97.2	22.50	223.	1231.	1498.
	C	0.038	25.75	99.5	25.67	98.4	24.88	97.2	24.08	237.	1312.	1598.
P/H	SR	0.005	14.73	99.7	14.72	99.5	14.63	99.3	14.53	136.	759.	929.
R	SR	0.008	3.73	99.6	3.72	99.4	3.70	99.1	3.67	34.	192.	235.
C/S	SR	0.139	62.53	99.2	62.01	95.4	57.55	91.8	53.21	574.	3124.	3775.
	C	0.139	65.22	99.2	64.69	95.4	60.24	91.8	55.90	599.	3263.	3945.
C/W	SR	0.101	62.93	99.3	62.54	96.5	59.11	93.8	55.89	579.	3170.	3844.
	C	0.101	65.30	99.3	64.91	96.5	61.48	93.8	58.26	600.	3292.	3994.
S/W	SR	0.063	30.75	99.4	30.60	97.6	29.23	95.8	27.90	283.	1557.	1891.
	C	0.063	32.64	99.4	32.49	97.6	31.12	95.8	29.79	300.	1654.	2011.
C/S/W	SR	0.088	25.63	99.4	25.44	96.8	23.75	94.5	22.15	236.	1284.	1554.
	C	0.088	27.47	99.4	27.28	96.8	25.59	94.5	23.99	253.	1380.	1670.

TABLE 15. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES EFFS.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.093	-3.80	99.3	-4.00	96.7	-5.78	94.2	-7.45	-36.	-237.	-312.
	C	0.093	-0.64	99.3	-0.84	96.7	-2.61	94.2	-4.28	-7.	-73.	-111.
S	SR	0.071	-12.87	99.4	-12.94	97.3	-13.54	95.4	-14.11	-119.	-678.	-838.
	C	0.071	-10.67	99.4	-10.73	97.3	-11.33	95.4	-11.90	-99.	-564.	-699.
P/H	SR	0.003	14.73	99.7	14.73	99.6	14.68	99.5	14.62	136.	759.	930.
R	SR	0.004	6.66	99.7	6.66	99.5	6.64	99.4	6.62	61.	344.	421.
C/S	SR	0.078	1.11	99.4	0.96	97.1	-0.34	95.0	-1.58	10.	28.	18.
	C	0.078	3.80	99.4	3.65	97.1	2.35	95.0	1.11	34.	166.	188.

TABLE 16. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES CYAL.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.164	-13.52	99.1	-13.71	96.6	-15.17	94.4	-16.46	-126.	-734.	-916.
	C	0.164	-10.35	99.1	-10.55	96.6	-12.00	94.4	-13.29	-96.	-571.	-716.
S	SR	0.126	-12.92	99.2	-13.00	97.1	-13.59	95.5	-14.08	-120.	-682.	-842.
	C	0.126	-10.72	99.2	-10.79	97.1	-11.39	95.5	-11.87	-99.	-568.	-703.
W	SR	0.038	2.50	99.4	2.46	98.7	2.12	98.0	1.79	23.	121.	145.
	C	0.038	4.08	99.4	4.04	98.7	3.69	98.0	3.36	37.	203.	244.
P/H	SR	0.005	-0.48	99.5	-0.46	99.4	-0.52	99.3	-0.57	-4.	-25.	-32.
R	SR	0.008	0.78	99.5	0.78	99.3	0.77	99.2	0.75	7.	40.	49.
C/S	SR	0.139	-4.90	99.2	-5.05	97.0	-6.20	95.1	-7.16	-46.	-281.	-358.
	C	0.139	-2.22	99.2	-2.37	97.0	-3.52	95.1	-4.47	-21.	-143.	-188.
C/W	SR	0.101	3.55	99.3	3.42	97.5	2.35	96.1	1.48	32.	158.	181.
	C	0.101	5.92	99.3	5.79	97.5	4.73	96.1	3.85	54.	280.	331.
S/W	SR	0.063	-1.21	99.4	-1.27	98.2	-1.75	97.1	-2.19	-11.	-74.	-96.
	C	0.063	0.68	99.4	0.62	98.2	0.14	97.1	-0.30	6.	24.	23.
C/S/W	SR	0.088	-0.75	99.3	-0.82	97.7	-1.46	96.4	-1.99	-7.	-53.	-73.
	C	0.088	1.10	99.3	1.02	97.7	0.39	96.4	-0.15	10.	42.	44.

TABLE 17. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES CM13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.394	5.73	98.3	4.80	88.1	-3.06	59.5	-25.19	49.	122.	12.
	C	0.394	8.89	98.3	7.97	88.1	0.11	59.5	-22.03	78.	286.	212.
	ST	0.193	-2.50	99.0	-2.97	94.1	-4.98	88.5	-9.22	-25.	-126.	-197.
	PT	0.178	-7.46	99.0	-7.89	94.4	-4.39	89.5	-8.04	-71.	-104.	-161.
S	SR	0.303	-12.90	98.6	-13.17	91.1	-15.34	77.0	-19.40	-120.	-716.	-910.
	C	0.303	-10.69	98.6	-10.96	91.1	-13.13	77.0	-17.20	-100.	-602.	-770.
	ST	0.148	-19.72	99.1	-19.86	95.2	-19.19	91.3	-20.24	-182.	-951.	-1175.
	PT	0.137	-25.16	99.2	-25.29	95.5	-19.28	91.9	-20.14	-233.	-959.	-1177.
W	SR	0.091	11.82	99.3	11.66	96.8	10.22	94.3	8.86	108.	577.	690.
	C	0.091	13.40	99.3	13.24	96.8	11.80	94.3	10.44	123.	659.	790.
	ST	0.044	6.44	99.5	6.36	98.2	7.16	96.8	6.47	59.	356.	480.
	PT	0.041	1.62	99.5	1.54	98.3	6.90	97.0	6.35	15.	381.	468.
P/H	SR	0.012	14.73	99.6	14.71	99.2	14.50	98.8	14.27	136.	756.	924.
	ST	0.006	8.99	99.6	8.98	99.5	10.43	99.2	10.38	83.	542.	667.
	PT	0.005	4.29	99.7	4.28	99.5	10.24	99.3	10.28	40.	532.	660.
F	SR	0.018	6.66	99.6	6.65	99.0	6.58	98.4	6.50	61.	342.	419.
C/S	SR	0.333	6.97	98.9	6.32	90.2	1.02	72.2	-10.46	61.	238.	209.
	C	0.333	9.66	98.9	9.01	90.2	3.70	72.2	-7.77	86.	377.	379.
	ST	0.163	-0.55	99.1	-0.86	94.8	-1.79	90.4	-4.52	-7.	1.	-27.
	PT	0.151	-5.75	99.1	-6.05	95.1	-1.53	91.1	-3.89	-54.	8.	-10.
C/W	SR	0.242	20.55	98.9	19.96	92.8	15.21	84.3	8.57	187.	948.	1100.
	C	0.242	22.92	98.9	22.33	92.8	17.58	84.3	10.94	209.	1071.	1250.
	ST	0.118	13.49	99.2	13.20	96.0	12.46	92.9	10.11	123.	731.	870.
	PT	0.109	8.14	99.3	7.86	96.2	12.55	93.4	10.48	74.	730.	877.
S/W	SR	0.151	3.94	99.1	3.72	95.1	1.84	91.1	-0.04	35.	159.	173.
	C	0.151	5.83	99.1	5.61	95.1	3.73	91.1	1.85	53.	257.	292.
	ST	0.074	-2.42	99.4	-2.53	97.3	-1.72	95.2	-2.61	-23.	-54.	-74.
	PT	0.068	-8.01	99.4	-8.11	97.4	-1.98	95.5	-2.71	-74.	-70.	-86.
C/S/W	SR	0.212	7.66	98.9	7.33	93.5	4.65	87.0	1.44	69.	333.	374.
	C	0.212	9.50	98.9	9.17	93.5	6.52	87.0	3.29	86.	428.	491.
	ST	0.104	1.38	99.3	1.21	96.4	1.60	93.7	0.32	12.	132.	149.
	PT	0.096	-4.24	99.3	-4.39	96.6	1.54	94.1	0.26	-40.	115.	136.

TABLE 17. (CONTINUED).

IRRIGATED CROP ROTATIONS

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.394	21.13	98.3	18.60	88.1	-0.97	59.5	-56.63	184.	656.	455.
	C	0.394	29.59	98.3	27.26	88.1	7.49	59.5	-48.17	262.	1092.	991.
	ST	0.193	5.05	99.0	3.87	94.1	-3.91	88.5	-14.69	41.	127.	41.
	PT	0.178	2.75	99.0	1.66	94.4	-0.24	89.5	-9.70	20.	295.	262.
S	SR	0.303	-22.92	98.6	-23.96	91.1	-32.35	77.0	-48.05	-216.	-1379.	-1813.
	C	0.303	-15.72	98.6	-16.76	91.1	-25.14	77.0	-40.85	-150.	-1007.	-1357.
	ST	0.148	-37.20	99.1	-37.72	95.2	-40.30	91.3	-44.59	-345.	-1930.	-2414.
	PT	0.137	-40.13	99.2	-40.62	95.5	-37.66	91.9	-41.47	-372.	-1803.	-2248.
W	SP	0.091	7.39	99.3	6.97	96.8	3.26	94.3	-0.23	66.	297.	319.
	C	0.091	13.46	99.3	13.04	96.8	9.33	94.3	5.84	122.	610.	703.
	ST	0.044	-4.73	99.5	-4.93	98.2	-5.31	96.8	-7.18	-45.	-207.	-274.
	PT	0.041	-7.30	99.5	-7.49	98.3	-3.23	97.0	-4.88	-68.	-104.	-140.
C/S	SR	0.333	27.86	98.5	25.99	90.2	10.65	72.2	-21.90	248.	1090.	1101.
	C	0.333	35.69	98.5	33.82	90.2	18.68	72.2	-14.07	321.	1494.	1596.
	ST	0.163	12.68	99.1	11.75	94.8	5.78	90.4	-2.13	113.	565.	603.
	PT	0.151	10.06	99.1	9.20	95.1	9.00	91.1	1.93	89.	714.	798.
C/S/W	SR	0.212	30.66	98.9	29.48	93.5	19.95	87.0	8.32	277.	1357.	1542.
	C	0.212	37.83	98.9	36.65	93.5	27.13	87.0	15.49	344.	1727.	1996.
	ST	0.104	16.43	99.3	15.85	96.4	12.52	93.7	7.76	149.	824.	952.
	PT	0.096	13.48	99.3	12.94	96.6	15.21	94.1	10.88	122.	951.	1119.

TABLE 18. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES CM35.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.948	-13.59	96.7	-15.15	35.1	-50.78	25.0	-56.63	-133.	-1126.	-1783.
	C	0.948	-10.43	96.7	-11.98	35.1	-47.62	25.0	-53.46	-103.	-962.	-1582.
	ST	0.365	-23.52	98.4	-24.17	89.2	-26.81	66.1	-40.05	-220.	-1195.	-1546.
	PT	0.328	-31.75	98.5	-32.33	90.3	-26.48	73.0	-36.25	-295.	-1201.	-1528.
S	SR	0.729	-20.11	97.3	-20.57	66.1	-27.31	25.0	-36.20	-188.	-1139.	-1527.
	C	0.729	-17.90	97.3	-18.36	66.1	-25.10	25.0	-33.99	-167.	-1025.	-1388.
	ST	0.280	-28.68	98.7	-28.87	91.7	-27.66	80.0	-30.08	-265.	-1376.	-1701.
	PT	0.252	-37.39	98.8	-37.56	92.5	-28.32	83.3	-30.06	-346.	-1415.	-1736.
W	SR	0.219	2.55	98.9	2.23	93.4	-0.34	86.4	-3.57	22.	71.	54.
	C	0.219	4.12	98.9	3.80	93.4	1.24	86.4	-1.99	37.	152.	153.
	ST	0.084	-4.49	99.4	-4.61	97.0	-3.33	94.7	-4.29	-42.	-133.	-171.
	PT	0.076	-12.38	99.4	-12.50	97.2	-4.13	95.1	-4.87	-115.	-178.	-216.
P/H	SR	0.029	14.73	99.6	14.67	98.7	14.18	97.7	13.66	136.	749.	912.
	ST	0.011	7.33	99.6	7.31	99.3	9.32	98.9	9.40	68.	498.	614.
	PT	0.010	-0.45	99.6	-0.47	99.3	8.73	99.0	8.77	-4.	457.	573.
P	SR	0.044	6.66	99.5	6.64	98.2	6.47	96.9	6.29	61.	340.	415.
C/S	SR	0.802	-8.94	97.1	-10.04	57.6	-28.85	25.0	-44.42	-88.	-720.	-1198.
	C	0.802	-6.25	97.1	-7.36	57.6	-26.17	25.0	-41.74	-63.	-581.	-1028.
	ST	0.309	-18.19	98.6	-18.64	90.9	-19.59	76.2	-26.52	-170.	-884.	-1130.
	PT	0.278	-26.65	98.7	-27.06	91.8	-19.75	80.4	-24.94	-248.	-906.	-1140.
C/W	SR	0.583	3.54	97.7	2.47	78.6	-9.27	25.0	-42.08	28.	-28.	-302.
	C	0.583	5.91	97.7	4.85	78.6	-6.90	25.0	-39.71	50.	95.	-152.
	ST	0.224	-5.24	98.9	-5.67	93.2	-6.42	85.9	-10.78	-50.	-213.	-298.
	PT	0.202	-13.87	99.0	-14.26	93.8	-6.81	87.8	-10.25	-130.	-243.	-321.
S/W	SR	0.365	-5.19	98.4	-5.61	89.2	-9.09	66.1	-17.77	-50.	-346.	-482.
	C	0.365	-3.30	98.4	-3.72	89.2	-7.20	66.1	-15.87	-32.	-249.	-362.
	ST	0.140	-13.29	99.2	-13.46	95.4	-12.16	91.7	-13.44	-123.	-579.	-720.
	PT	0.126	-22.15	99.2	-22.31	95.8	-13.01	92.5	-13.98	-205.	-627.	-767.
C/S/W	SR	0.510	1.55	98.0	0.39	83.0	-5.58	25.0	-30.61	11.	-47.	-199.
	C	0.510	3.40	98.0	2.74	83.0	-3.74	25.0	-28.76	28.	49.	-83.
	ST	0.196	-6.46	99.0	-6.73	94.0	-6.19	88.2	-8.57	-61.	-245.	-320.
	PT	0.177	-15.35	99.0	-15.59	94.5	-6.98	89.5	-8.84	-143.	-292.	-366.

TABLE 18. (CONTINUED).

IRRIGATED CROP ROTATIONS

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
S	SR	0.729	-38.85	97.3	-40.88	66.1	-70.65	25.0	-109.92	-368.	-2451.	-3584.
	C	0.729	-31.65	97.3	-33.68	66.1	-63.44	25.0	-102.71	-301.	-2079.	-3128.
	ST	0.280	-54.81	98.7	-55.64	91.7	-59.58	80.0	-70.65	-509.	-2846.	-3575.
	PT	0.252	-61.01	98.8	-61.76	92.5	-57.18	83.3	-65.74	-566.	-2745.	-3428.
W	SR	0.219	-10.54	98.9	-11.41	93.4	-18.35	86.4	-27.08	-101.	-709.	-958.
	C	0.219	-4.47	98.9	-5.33	93.4	-12.28	86.4	-21.00	-45.	-396.	-574.
	ST	0.094	-24.28	99.4	-24.62	97.0	-25.25	94.7	-28.01	-225.	-1198.	-1500.
	PT	0.076	-29.93	99.4	-30.23	97.2	-23.61	95.1	-26.00	-277.	-1123.	-1396.

TABLE 19. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES CWLM.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.012	-2.15	99.4	-2.16	98.7	-2.19	98.0	-2.22	-20.	-112.	-137.

TABLE 20. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES LROC.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.018	-2.15	99.4	-2.16	98.4	-2.20	97.4	-2.25	-20.	-112.	-138.

TABLE 21. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES LYAL.

		PERCENT TOPSOIL	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR							PRESENT VALUE OF A PROFIT STREAM TO YEAR		
ROT.	CP	LOST/YR	YR 1	YEAR 10		YEAR 100		YEAR 200		10	100	200
C	SR	0.128	15.28	99.2	15.05	97.1	13.24	95.4	11.76	140.	745.	892.
	C	0.128	18.45	99.2	18.22	97.1	16.41	95.4	14.92	169.	908.	1093.
S	SR	0.098	-5.76	99.3	-5.84	97.6	-6.45	96.2	-6.95	-53.	-312.	-389.
	C	0.098	-3.56	99.3	-3.63	97.6	-4.24	96.2	-4.74	-33.	-198.	-250.
W	SR	0.029	17.90	99.4	17.86	98.8	17.50	98.3	17.14	165.	916.	1118.
	C	0.029	19.48	99.4	19.44	98.8	19.07	98.3	18.71	179.	997.	1218.
P/H	SR	0.004	7.08	99.5	7.08	99.4	7.04	99.3	6.99	65.	365.	447.
R	SR	0.006	6.64	99.5	6.64	99.4	6.62	99.2	6.60	61.	342.	420.
C/S	SR	0.108	16.82	99.2	16.66	97.4	15.31	95.9	14.21	154.	836.	1010.
	C	0.108	19.51	99.2	19.35	97.4	18.00	95.9	16.90	179.	975.	1180.
C/W	SR	0.079	29.78	99.3	29.63	97.9	28.40	96.7	27.34	274.	1509.	1834.
	C	0.079	32.15	99.3	32.01	97.9	30.77	96.7	29.71	296.	1631.	1984.
S/W	SR	0.049	11.27	99.4	11.21	98.4	10.70	97.6	10.23	104.	570.	693.
	C	0.049	13.16	99.4	13.10	98.4	12.59	97.6	12.12	121.	668.	812.
C/S/W	SR	0.069	10.04	99.3	9.96	98.1	9.31	97.0	8.74	92.	503.	609.
	C	0.069	11.83	99.3	11.81	98.1	11.15	97.0	10.59	109.	598.	726.

TABLE 22. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MGCY.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.179	-13.52	99.1	-13.73	96.4	-15.29	93.9	-16.74	-126.	-737.	-921.
	C	0.179	-10.35	99.1	-10.57	96.4	-12.12	93.9	-13.58	-96.	-574.	-721.
S	SR	0.138	-12.92	99.2	-13.00	97.0	-13.64	95.1	-14.17	-120.	-683.	-844.
	C	0.138	-10.72	99.2	-10.80	97.0	-11.43	95.1	-11.96	-99.	-569.	-704.
W	SR	0.041	2.50	99.4	2.46	98.6	2.09	97.8	1.73	23.	121.	143.
	C	0.041	4.08	99.4	4.04	98.6	3.66	97.8	3.31	37.	202.	243.
P/H	SR	0.006	-0.48	99.5	-0.48	99.4	-0.53	99.2	-0.58	-4.	-26.	-32.
R	SR	0.008	0.78	99.5	0.78	99.3	0.76	99.1	0.75	7.	40.	49.
C/S	SR	0.151	-4.91	99.2	-5.07	96.8	-6.29	94.8	-7.34	-46.	-284.	-362.
	C	0.151	-2.22	99.2	-2.38	96.8	-3.61	94.8	-4.65	-21.	-145.	-192.
C/W	SR	0.110	3.54	99.2	3.40	97.4	2.27	95.9	1.34	32.	156.	178.
	C	0.110	5.92	99.2	5.77	97.4	4.64	95.9	3.71	54.	278.	328.
S/W	SR	0.069	-1.21	99.3	-1.27	98.1	-1.80	97.0	-2.26	-11.	-75.	-98.
	C	0.069	0.68	99.3	0.62	98.1	0.09	97.0	-0.37	6.	23.	22.
C/S/W	SR	0.096	-0.75	99.3	-0.83	97.6	-1.51	96.2	-2.08	-7.	-55.	-75.
	C	0.096	1.10	99.3	1.02	97.6	0.33	96.2	-0.23	10.	40.	42.

TABLE 23. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MK01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.191	-13.44	99.0	-13.79	94.1	-16.63	88.5	-19.84	-126.	-761.	-968.
	C	0.191	-10.27	99.0	-10.62	94.1	-13.47	88.5	-16.67	-96.	-598.	-768.
S	SR	0.147	-15.96	99.1	-16.08	95.2	-17.09	91.3	-18.09	-148.	-847.	-1051.
	C	0.147	-13.75	99.1	-13.87	95.2	-14.88	91.3	-15.88	-127.	-734.	-911.
W	SR	0.044	-6.68	99.5	-6.73	98.2	-7.23	96.8	-7.73	-62.	-356.	-442.
	C	0.044	-5.10	99.5	-5.16	98.2	-5.65	96.8	-6.15	-47.	-275.	-343.
P/H	SR	0.006	-0.41	99.6	-0.42	99.5	-0.49	99.3	-0.57	-4.	-23.	-29.
R	SR	0.009	2.26	99.6	2.26	99.4	2.23	99.0	2.20	21.	116.	142.
C/S	SR	0.162	-6.54	99.1	-6.80	94.8	-8.93	90.5	-11.11	-62.	-388.	-501.
	C	0.162	-3.86	99.1	-4.11	94.8	-6.24	90.5	-8.43	-37.	-249.	-331.
C/W	SR	0.118	-1.46	99.3	-1.67	96.0	-3.49	92.9	-5.22	-14.	-118.	-166.
	C	0.118	0.91	99.3	0.70	96.0	-1.12	92.9	-2.85	7.	5.	-16.
S/W	SR	0.074	-7.96	99.4	-8.04	97.3	-8.79	95.2	-9.50	-74.	-428.	-534.
	C	0.074	-6.07	99.4	-6.15	97.3	-6.90	95.2	-7.61	-56.	-330.	-414.
C/S/W	SR	0.103	-5.20	99.3	-5.32	96.4	-6.37	93.7	-7.36	-49.	-293.	-372.
	C	0.103	-3.36	99.3	-3.48	96.4	-4.53	93.7	-5.52	-32.	-198.	-255.
IRRIGATED CROP ROTATIONS												
C	SR	0.191	-36.73	99.0	-37.55	94.1	-44.24	88.5	-51.76	-342.	-2055.	-2601.
	C	0.191	-28.27	99.0	-29.09	94.1	-35.78	88.5	-43.30	-264.	-1618.	-2066.
S	SR	0.147	-54.46	99.1	-54.83	95.2	-57.95	91.3	-61.05	-504.	-2885.	-3573.
	C	0.147	-47.25	99.1	-47.62	95.2	-50.75	91.3	-53.85	-437.	-2513.	-3118.
W	SR	0.044	-46.21	99.5	-46.34	98.2	-47.54	96.8	-48.74	-427.	-2412.	-2972.
	C	0.044	-40.14	99.5	-40.27	98.2	-41.47	96.8	-42.67	-371.	-2099.	-2588.
C/S	SR	0.162	-25.37	99.1	-26.02	94.8	-31.48	90.5	-37.07	-237.	-1438.	-1829.
	C	0.162	-17.54	99.1	-18.19	94.8	-23.65	90.5	-29.24	-165.	-1034.	-1333.
C/S/W	SR	0.103	-25.46	99.3	-25.86	96.4	-29.34	93.7	-32.62	-237.	-1395.	-1752.
	C	0.103	-18.29	99.3	-18.69	96.4	-22.17	93.7	-25.45	-170.	-1024.	-1298.

TABLE 24. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MK13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.383	-23.08	98.4	-23.65	88.5	-28.38	62.1	-41.15	-215.	-1297.	-1671.
	C	0.383	-19.91	98.4	-20.48	88.5	-25.22	62.1	-37.98	-186.	-1133.	-1471.
	ST	0.211	-31.34	98.9	-31.66	93.6	-32.42	87.1	-35.48	-290.	-1585.	-1971.
	PT	0.204	-36.29	99.0	-36.60	93.8	-32.05	87.6	-34.84	-336.	-1568.	-1943.
S	SR	0.295	-21.50	98.7	-21.69	91.3	-23.17	78.2	-25.82	-199.	-1145.	-1424.
	C	0.295	-19.30	98.7	-19.48	91.3	-20.96	78.2	-23.61	-179.	-1031.	-1285.
	ST	0.162	-28.34	99.1	-28.44	94.8	-27.49	90.8	-28.30	-262.	-1390.	-1709.
	PT	0.157	-33.78	99.1	-33.88	95.0	-27.65	90.8	-28.32	-312.	-1399.	-1713.
W	SR	0.088	-12.85	99.4	-12.94	96.8	-13.72	94.5	-14.46	-119.	-681.	-845.
	C	0.088	-11.28	99.4	-11.37	96.8	-12.15	94.5	-12.88	-104.	-600.	-745.
	ST	0.049	-18.24	99.5	-18.29	98.0	-17.19	96.6	-17.58	-168.	-872.	-1070.
	PT	0.047	-23.06	99.5	-23.11	98.1	-17.49	96.7	-17.78	-213.	-886.	-1084.
P/H	SR	0.012	-0.41	99.6	-0.42	99.3	-0.57	98.8	-0.74	-4.	-24.	-32.
	ST	0.006	-6.15	99.6	-6.16	99.4	-4.69	99.2	-4.71	-57.	-239.	-290.
	PT	0.006	-10.85	99.6	-10.86	99.4	-4.68	99.2	-4.82	-100.	-249.	-297.
P	SR	0.018	2.26	99.6	2.25	99.0	2.20	98.5	2.15	21.	116.	141.
C/S	SR	0.324	-15.57	98.6	-15.98	90.5	-19.29	73.7	-26.15	-145.	-880.	-1130.
	C	0.324	-12.89	98.6	-13.30	90.5	-16.61	73.7	-23.46	-121.	-742.	-960.
	ST	0.178	-23.11	99.0	-23.34	94.4	-23.43	89.4	-25.39	-214.	-1145.	-1422.
	PT	0.173	-28.31	99.1	-28.54	94.6	-23.31	89.8	-25.09	-262.	-1140.	-1409.
C/W	SR	0.236	-10.81	98.8	-11.15	92.9	-13.92	84.9	-17.66	-101.	-623.	-800.
	C	0.236	-8.43	98.8	-8.78	92.9	-11.54	84.9	-15.29	-79.	-501.	-650.
	ST	0.130	-17.88	99.2	-18.07	95.7	-17.91	92.3	-19.42	-166.	-868.	-1079.
	PT	0.126	-23.24	99.2	-23.42	95.8	-17.96	92.5	-19.32	-215.	-872.	-1077.
S/W	SR	0.147	-14.45	99.1	-14.59	95.2	-15.70	91.3	-16.80	-134.	-772.	-960.
	C	0.147	-12.56	99.1	-12.70	95.2	-13.81	91.3	-14.91	-116.	-675.	-840.
	ST	0.081	-20.82	99.4	-20.89	97.0	-19.74	94.8	-20.29	-192.	-996.	-1225.
	PT	0.079	-26.42	99.4	-26.49	97.1	-20.06	95.0	-20.50	-244.	-1013.	-1239.
C/S/W	SR	0.206	-9.54	98.9	-9.74	93.7	-11.42	87.4	-13.42	-89.	-532.	-673.
	C	0.206	-7.69	98.9	-7.90	93.7	-9.58	87.4	-11.58	-72.	-437.	-557.
	ST	0.113	-15.83	99.3	-15.94	96.1	-15.13	93.2	-16.01	-146.	-747.	-923.
	PT	0.110	-21.45	99.3	-21.56	96.2	-15.47	93.3	-16.22	-198.	-765.	-938.

TABLE 24. (CONTINUED).

IRRIGATED CROP ROTATIONS

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
S	SR	0.295	-70.45	98.7	-71.04	91.3	-75.69	78.2	-84.06	-652.	-3746.	-4659.
	C	0.295	-63.25	98.7	-63.83	91.3	-68.49	78.2	-76.86	-586.	-3374.	-4203.
	ST	0.162	-84.77	99.1	-85.09	94.8	-85.99	90.5	-88.70	-783.	-4346.	-5356.
	PT	0.157	-87.71	99.1	-88.02	95.0	-83.60	90.8	-86.09	-810.	-4225.	-5200.
W	SR	0.088	-54.10	99.4	-54.30	96.8	-66.11	94.5	-67.81	-592.	-3350.	-4128.
	C	0.088	-58.03	99.4	-58.23	96.8	-60.04	94.5	-61.74	-536.	-3037.	-3744.
	ST	0.049	-76.22	99.5	-76.33	98.0	-75.83	96.6	-76.81	-703.	-3878.	-4763.
	PT	0.047	-78.79	99.5	-78.90	98.1	-73.87	96.7	-74.73	-727.	-3778.	-4634.

TABLE 25. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MK35.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
P/H	SR	0.018	-0.41	99.6	-0.43	99.0	-0.66	98.4	-0.90	-4.	-26.	-35.
R	SR	0.027	2.26	99.6	2.25	98.7	2.18	97.8	2.10	21.	115.	140.

TABLE 26. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MM01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.292	5.56	97.8	4.37	87.0	-3.93	71.4	-15.98	46.	76.	-14.
	C	0.292	8.73	97.8	7.53	87.0	-0.76	71.4	-12.81	75.	239.	186.
S	SR	0.224	-5.80	98.1	-6.24	89.4	-9.40	80.4	-12.63	-55.	-379.	-502.
	C	0.224	-3.60	98.1	-4.03	89.4	-7.19	80.4	-10.43	-35.	-265.	-362.
W	SR	0.067	17.88	99.1	17.65	95.7	15.58	92.7	13.71	164.	876.	1049.
	C	0.067	19.46	99.1	19.22	95.7	17.16	92.7	15.29	178.	957.	1148.
P/H	SR	0.009	-0.48	99.4	-0.50	98.9	-0.70	98.4	-0.91	-4.	-29.	-38.
R	SR	0.013	6.64	99.4	6.63	98.7	6.53	97.9	6.43	61.	341.	416.
C/S	SR	0.247	10.82	98.0	9.93	88.6	3.55	77.9	-3.70	96.	397.	410.
	C	0.247	13.51	98.0	12.61	88.6	6.24	77.9	-1.01	121.	536.	580.
C/W	SR	0.180	23.79	98.4	22.99	91.0	16.93	84.5	11.62	216.	1078.	1252.
	C	0.180	26.16	98.4	25.36	91.0	19.30	84.5	14.00	238.	1201.	1402.
S/W	SR	0.112	11.23	98.8	10.90	93.7	6.11	89.4	5.78	102.	514.	598.
	C	0.112	13.12	98.8	12.79	93.7	10.00	89.4	7.68	120.	612.	717.
C/S/W	SR	0.157	7.50	98.5	7.08	91.8	3.78	86.2	1.01	67.	307.	338.
	C	0.157	9.35	98.5	8.92	91.8	5.62	86.2	2.86	84.	402.	455.

TABLE 27. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MM13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.608	-13.71	96.1	-15.48	69.3	-31.00	0.0	0.0	-135.	-1014.	-1425.
	C	0.608	-10.55	96.1	-12.31	69.3	-27.83	0.0	0.0	-105.	-851.	-1232.
	ST	0.321	-21.90	97.5	-22.88	86.0	-27.81	66.0	-39.31	-206.	-1208.	-1568.
	PT	0.306	-26.85	97.7	-27.79	86.5	-27.20	68.8	-37.26	-252.	-1186.	-1529.
S	SR	0.467	-13.00	96.8	-13.69	79.4	-18.71	17.1	-36.66	-123.	-789.	-1064.
	C	0.467	-10.79	96.8	-11.49	79.4	-16.50	17.1	-34.45	-103.	-675.	-924.
	ST	0.247	-19.80	98.0	-20.18	88.6	-21.09	77.9	-24.11	-184.	-998.	-1251.
	PT	0.236	-25.24	98.1	-25.60	89.0	-21.16	79.2	-23.81	-234.	-1004.	-1251.
W	SR	0.140	2.46	98.6	2.11	92.5	-0.75	87.4	-3.11	21.	58.	39.
	C	0.140	4.04	98.6	3.68	92.5	0.83	87.4	-1.53	36.	140.	138.
	ST	0.074	-2.91	99.0	-3.10	95.4	-3.23	92.2	-4.67	-28.	-105.	-150.
	PT	0.071	-7.73	99.1	-7.91	95.6	-3.47	92.5	-4.77	-72.	-123.	-161.
P/H	SR	0.019	-0.48	99.4	-0.52	98.4	-0.93	97.3	-1.35	-5.	-34.	-46.
	ST	0.010	-6.22	99.4	-6.24	98.9	-4.90	98.3	-5.08	-57.	-246.	-300.
	PT	0.009	-10.92	99.4	-10.94	98.9	-5.09	98.4	-5.17	-101.	-256.	-306.
R	SR	0.029	6.64	99.3	6.62	97.8	6.42	96.3	6.22	61.	338.	412.
C/S	SR	0.514	-5.05	96.6	-6.41	76.6	-16.75	0.0	0.0	-53.	-491.	-807.
	C	0.514	-2.37	96.6	-3.72	76.6	-14.06	0.0	0.0	-28.	-353.	-637.
	ST	0.272	-12.54	97.9	-13.29	87.7	-16.73	74.6	-23.46	-119.	-688.	-904.
	PT	0.259	-17.74	97.9	-18.45	88.2	-16.45	76.3	-22.41	-167.	-679.	-884.
C/W	SR	0.374	3.42	97.3	2.22	83.9	-6.01	52.9	-24.99	26.	-30.	-163.
	C	0.374	5.79	97.3	4.59	83.9	-3.63	52.9	-22.62	48.	93.	-13.
	ST	0.197	-3.61	98.3	-4.26	90.3	-7.34	83.0	-11.76	-36.	-214.	-315.
	PT	0.188	-8.96	98.4	-9.59	90.7	-7.24	83.8	-11.29	-85.	-215.	-307.
S/W	SR	0.234	-1.27	98.1	-1.79	89.0	-5.56	79.4	-9.58	-14.	-161.	-242.
	C	0.234	0.62	98.1	0.10	89.0	-3.67	79.4	-7.69	3.	-63.	-122.
	ST	0.123	-7.61	98.7	-7.89	93.2	-8.39	88.6	-10.24	-71.	-354.	-457.
	PT	0.118	-13.20	98.8	-13.48	93.4	-8.64	89.0	-10.31	-123.	-370.	-468.
C/S/W	SR	0.327	-0.82	97.6	-1.53	85.7	-6.37	64.6	-14.99	-11.	-165.	-270.
	C	0.327	1.02	97.6	0.32	85.7	-4.52	64.6	-13.14	6.	-70.	-153.
	ST	0.173	-7.08	98.5	-7.47	91.2	-8.60	85.0	-11.07	-67.	-345.	-452.
	PT	0.165	-12.70	98.5	-13.07	91.5	-8.85	85.6	-11.09	-119.	-360.	-463.

TABLE 28. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MN01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.219	44.21	98.9	43.42	93.4	37.02	86.4	28.97	404.	2131.	2530.
	C	0.219	47.38	98.9	46.59	93.4	40.18	86.4	32.13	433.	2294.	2730.
S	SR	0.168	1.47	99.1	1.24	94.7	-0.66	90.1	-2.65	13.	31.	15.
	C	0.168	3.68	99.1	3.45	94.7	1.54	90.1	-0.44	33.	145.	154.
W	SR	0.050	18.00	99.5	17.90	98.0	16.96	96.5	16.03	166.	908.	1102.
	C	0.050	19.58	99.5	19.48	98.0	18.54	96.5	17.61	180.	990.	1201.
P/H	SR	0.007	14.73	99.6	14.72	99.4	14.60	99.2	14.47	136.	758.	927.
R	SR	0.010	5.19	99.6	5.19	99.3	5.15	99.0	5.11	48.	267.	327.
C/S	SR	0.185	38.68	99.0	38.12	94.2	33.57	89.0	28.55	354.	1889.	2259.
	C	0.185	41.37	99.0	40.81	94.2	36.25	89.0	31.23	379.	2028.	2429.
C/W	SR	0.135	47.67	99.2	47.22	95.6	43.38	92.0	39.67	438.	2371.	2860.
	C	0.135	50.04	99.2	49.59	95.6	45.75	92.0	42.04	459.	2494.	3010.
S/W	SR	0.084	15.35	99.4	15.19	97.0	13.79	94.7	12.46	141.	760.	915.
	C	0.084	17.24	99.4	17.08	97.0	15.68	94.7	14.35	158.	858.	1034.
C/S/W	SR	0.118	15.30	99.3	15.09	96.0	13.24	92.9	11.49	140.	747.	894.
	C	0.118	17.15	99.3	16.93	96.0	15.09	92.9	13.34	157.	842.	1010.
IRRIGATED CROP ROTATIONS												
C	SR	0.219	98.59	98.9	96.72	93.4	81.70	86.4	62.80	901.	4734.	5609.
	C	0.219	107.05	98.9	105.18	93.4	90.15	86.4	71.26	979.	5170.	6145.
S	SR	0.168	0.92	99.1	0.20	94.7	-5.76	90.1	-11.97	5.	-93.	-187.
	C	0.168	8.12	99.1	7.40	94.7	1.45	90.1	-4.76	72.	279.	269.
W	SR	0.050	43.15	99.5	42.86	98.0	40.14	96.5	37.46	397.	2167.	2622.
	C	0.050	49.22	99.5	48.93	98.0	46.21	96.5	43.53	453.	2481.	3007.
C/S	SR	0.185	88.84	99.0	87.43	94.2	75.83	89.0	63.06	813.	4313.	5142.
	C	0.185	96.67	99.0	95.26	94.2	83.05	89.0	70.89	885.	4717.	5638.
C/S/W	SR	0.118	85.75	99.3	84.86	96.0	77.35	92.9	70.21	787.	4253.	5122.
	C	0.118	92.93	99.3	92.05	96.0	84.52	92.9	77.38	853.	4623.	5575.

TABLE 29. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MO03.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.137	25.02	99.2	24.60	95.5	21.05	91.9	17.60	229.	1209.	1439.
	C	0.137	28.19	99.2	27.77	95.5	24.21	91.9	20.76	258.	1372.	1639.
	ST	0.075	16.76	99.4	16.53	97.2	16.23	95.1	14.30	154.	911.	1095.
	PT	0.073	11.80	99.4	11.57	97.3	16.59	95.3	14.81	108.	928.	1123.
S	SR	0.105	-5.71	99.3	-5.83	96.4	-6.88	93.6	-7.88	-53.	-319.	-404.
	C	0.105	-3.50	99.3	-3.62	96.4	-4.68	93.6	-5.68	-33.	-205.	-264.
	ST	0.058	-12.54	99.5	-12.61	97.7	-11.42	96.1	-11.95	-116.	-568.	-699.
	PT	0.056	-17.98	99.5	-18.05	97.8	-11.58	96.2	-12.00	-166.	-577.	-704.
W	SR	0.032	2.58	99.6	2.53	98.6	2.08	97.6	1.61	24.	123.	145.
	C	0.032	4.15	99.6	4.11	98.6	3.65	97.6	3.19	38.	204.	245.
	ST	0.017	-2.81	99.6	-2.84	99.1	-1.54	98.5	-1.75	-26.	-71.	-86.
	PT	0.017	-7.63	99.6	-7.66	99.1	-1.85	98.5	-1.96	-70.	-87.	-100.
P/H	SR	0.004	14.73	99.7	14.72	99.5	14.65	99.4	14.57	136.	759.	929.
	ST	0.002	8.99	99.7	8.99	99.6	10.50	99.5	10.52	83.	544.	670.
	PT	0.002	4.29	99.7	4.28	99.6	10.30	99.5	10.41	40.	533.	663.
R	SR	0.006	2.26	99.6	2.26	99.4	2.24	99.2	2.22	21.	116.	142.
C/S	SR	0.116	22.86	99.3	22.57	96.1	20.03	93.0	17.63	210.	1121.	1344.
	C	0.116	25.55	99.3	25.25	96.1	22.72	93.0	20.31	234.	1260.	1514.
	ST	0.064	15.31	99.4	15.15	97.6	15.47	95.8	14.10	140.	850.	1029.
	PT	0.062	10.11	99.4	9.95	97.6	15.57	95.9	14.34	93.	854.	1040.
C/W	SR	0.084	27.34	99.4	27.11	97.0	25.06	94.7	23.12	251.	1365.	1648.
	C	0.084	29.71	99.4	29.48	97.0	27.43	94.7	25.49	273.	1487.	1798.
	ST	0.046	20.26	99.5	20.13	98.1	20.75	96.7	19.64	186.	1113.	1354.
	PT	0.045	14.90	99.5	14.78	98.1	20.69	96.8	19.71	137.	1108.	1355.
S/W	SR	0.053	2.85	99.5	2.77	97.9	2.05	96.4	1.35	26.	131.	152.
	C	0.053	4.74	99.5	4.66	97.9	3.94	96.4	3.24	43.	229.	271.
	ST	0.029	-3.52	99.6	-3.56	98.7	-2.16	97.7	-2.51	-33.	-97.	-120.
	PT	0.028	-9.11	99.6	-9.16	98.7	-2.49	97.8	-2.72	-84.	-114.	-134.
C/S/W	SR	0.074	7.00	99.4	6.89	97.3	5.85	95.2	4.86	64.	338.	402.
	C	0.074	8.85	99.4	8.73	97.3	7.69	95.2	6.70	81.	433.	518.
	ST	0.040	0.71	99.5	0.65	98.3	1.86	97.0	1.33	6.	117.	140.
	PT	0.039	-4.91	99.5	-4.97	98.3	1.51	97.1	1.10	-46.	98.	124.

TABLE 29. (CONTINUED).

IRRIGATED CROP ROTATIONS

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.137	79.33	99.2	78.23	95.5	68.93	91.9	59.91	727.	3879.	4641.
	C	0.137	87.79	99.2	86.69	95.5	77.39	91.9	68.37	805.	4315.	5177.
	ST	0.075	63.16	99.4	62.55	97.2	58.86	95.1	53.68	580.	3230.	3896.
	PT	0.073	60.85	99.4	60.26	97.3	61.97	95.3	57.03	559.	3385.	4095.
S	SR	0.105	-14.85	99.3	-15.26	96.4	-18.76	93.6	-22.07	-139.	-848.	-1081.
	C	0.105	-7.65	99.3	-8.05	96.4	-11.56	93.6	-14.86	-72.	-476.	-625.
	ST	0.058	-29.17	99.5	-29.40	97.7	-29.64	96.1	-31.57	-270.	-1459.	-1809.
	PT	0.056	-32.12	99.5	-32.33	97.8	-27.26	96.2	-29.03	-297.	-1338.	-1653.
W	SR	0.032	-10.46	99.6	-10.59	98.6	-11.81	97.6	-13.07	-97.	-567.	-710.
	C	0.032	-4.39	99.6	-4.52	98.6	-5.74	97.6	-6.99	-41.	-254.	-326.
	ST	0.017	-22.59	99.6	-22.66	99.1	-21.60	98.5	-22.46	-209.	-1101.	-1354.
	PT	0.017	-25.16	99.6	-25.23	99.1	-19.84	98.5	-20.40	-232.	-1001.	-1226.
C/S	SR	0.116	68.19	99.3	67.37	96.1	60.29	93.0	53.58	625.	3357.	4029.
	C	0.116	76.02	99.3	75.20	96.1	68.12	93.0	61.41	697.	3761.	4524.
	ST	0.064	52.95	99.4	52.49	97.6	50.14	95.8	46.19	486.	2733.	3304.
	PT	0.062	50.32	99.4	49.88	97.6	52.90	95.9	49.15	462.	2872.	3481.
C/S/W	SR	0.074	52.08	99.4	51.61	97.3	47.36	95.2	43.30	478.	2592.	3125.
	C	0.074	59.25	99.4	59.78	97.3	54.53	95.2	50.48	544.	2963.	3579.
	ST	0.040	37.81	99.5	37.55	98.3	36.91	97.0	34.52	348.	1991.	2414.
	PT	0.039	34.85	99.5	34.60	98.3	39.29	97.1	37.06	320.	2111.	2569.

TABLE 30. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES MC35.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.020	2.25	99.6	2.25	99.0	2.20	98.3	2.14	21.	115.	141.

TABLE 31. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES CC01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.175	5.79	99.1	5.36	94.5	1.35	89.7	-1.90	51.	216.	221.
	C	0.175	8.95	99.1	8.53	94.5	5.01	89.7	1.27	81.	379.	422.
S	SR	0.135	-12.88	99.2	-13.00	95.6	-14.05	92.0	-15.06	-119.	-689.	-858.
	C	0.135	-10.67	99.2	-10.80	95.6	-11.84	92.0	-12.86	-99.	-575.	-718.
W	SR	0.040	5.66	99.5	5.60	98.3	4.99	97.1	4.37	52.	279.	334.
	C	0.040	7.24	99.5	7.17	98.3	6.56	97.1	5.95	66.	360.	434.
P/H	SR	0.005	7.16	99.7	7.15	99.5	7.07	99.3	6.98	66.	368.	450.
R	SR	0.008	2.26	99.6	2.26	99.4	2.23	99.1	2.21	21.	116.	142.
C/S	SR	0.148	7.02	99.1	6.72	95.2	4.21	91.3	1.72	63.	303.	341.
	C	0.148	9.70	99.1	9.40	95.2	6.39	91.3	4.41	88.	442.	511.
C/W	SR	0.108	17.19	99.3	16.93	96.3	14.68	93.5	12.57	157.	835.	997.
	C	0.108	19.56	99.3	19.30	96.3	17.05	93.5	14.94	179.	956.	1147.
S/W	SR	0.067	0.55	99.4	0.46	97.5	-0.39	95.6	-1.22	5.	9.	1.
	C	0.067	2.45	99.4	2.35	97.5	1.50	95.6	0.67	22.	107.	121.
C/S/W	SR	0.094	2.94	99.3	2.80	96.7	1.62	94.2	0.50	26.	124.	138.
	C	0.094	4.78	99.3	4.65	96.7	3.46	94.2	2.34	43.	220.	255.

TABLE 32. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES OC13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.492	-3.90	98.0	-4.90	83.9	-14.43	28.1	-52.10	-41.	-392.	-683.
	C	0.492	-0.73	98.0	-1.73	83.9	-11.26	28.1	-48.93	-11.	-228.	-483.
	ST	0.241	-12.12	98.8	-12.63	92.8	-14.59	84.4	-20.47	-114.	-629.	-820.
	PT	0.222	-17.08	98.9	-17.55	93.3	-14.27	86.1	-18.94	-160.	-607.	-781.
S	SR	0.379	-20.08	98.4	-20.33	88.7	-22.43	63.1	-27.97	-186.	-1083.	-1364.
	C	0.379	-17.88	98.4	-18.13	88.7	-20.22	63.1	-25.76	-166.	-970.	-1224.
	ST	0.185	-26.91	99.0	-27.04	94.2	-26.26	89.0	-27.32	-249.	-1320.	-1626.
	PT	0.171	-32.35	99.1	-32.47	94.6	-26.36	89.9	-27.20	-299.	-1328.	-1628.
W	SR	0.114	-0.52	99.3	-0.68	96.1	-2.04	93.2	-3.33	-6.	-58.	-88.
	C	0.114	1.06	99.3	0.90	96.1	-0.46	93.2	-1.75	9.	23.	12.
	ST	0.056	-5.90	99.5	-5.98	97.8	-5.15	96.2	-5.79	-55.	-241.	-300.
	PT	0.051	-10.72	99.5	-10.80	97.9	-5.41	96.4	-5.91	-99.	-256.	-312.
P/H	SR	0.015	7.16	99.6	7.14	99.1	6.91	98.6	6.67	66.	365.	444.
	ST	0.007	1.42	99.6	1.41	99.4	2.85	99.1	2.79	13.	151.	188.
	PT	0.007	-3.28	99.6	-3.29	99.4	2.66	99.2	2.70	-30.	141.	181.
R	SR	0.023	2.26	99.6	2.25	98.9	2.19	98.1	2.12	21.	115.	140.
C/S	SR	0.417	-2.96	98.3	-3.64	87.3	-9.52	53.5	-27.63	-30.	-280.	-452.
	C	0.417	-0.27	98.3	-0.95	87.3	-6.84	53.5	-24.95	-6.	-141.	-282.
	ST	0.204	-10.48	99.0	-10.82	93.8	-11.80	87.6	-15.01	-98.	-514.	-660.
	PT	0.188	-15.68	99.0	-16.00	94.2	-11.53	88.8	-14.25	-146.	-506.	-641.
C/W	SR	0.303	7.82	98.6	7.20	91.1	2.27	77.0	-6.97	69.	289.	281.
	C	0.303	10.19	98.6	9.57	91.1	4.64	77.0	-4.60	91.	411.	431.
	ST	0.148	0.76	99.1	0.45	95.2	-0.32	91.3	-2.81	6.	72.	62.
	PT	0.137	-4.59	99.2	-4.88	95.5	-0.23	91.9	-2.40	-44.	71.	69.
S/W	SR	0.189	-6.86	99.0	-7.08	94.1	-8.83	88.7	-10.78	-64.	-396.	-507.
	C	0.189	-4.97	99.0	-5.19	94.1	-6.94	88.7	-8.89	-47.	-298.	-387.
	ST	0.093	-13.22	99.3	-13.33	96.7	-12.46	94.2	-13.28	-122.	-611.	-755.
	PT	0.086	-18.82	99.4	-18.92	96.9	-12.73	94.6	-13.39	-174.	-627.	-768.
C/S/W	SR	0.265	-2.03	98.7	-2.35	92.2	-4.96	81.9	-9.02	-20.	-166.	-239.
	C	0.265	-0.18	98.7	-0.51	92.2	-3.12	81.9	-7.18	-3.	-71.	-123.
	ST	0.130	-8.31	99.2	-8.47	95.7	-8.05	92.3	-9.31	-77.	-368.	-463.
	PT	0.120	-13.93	99.2	-14.08	96.0	-8.31	92.8	-9.37	-129.	-384.	-475.

TABLE 33. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES PTSS.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.189	-3.62	98.4	-3.65	90.6	-3.88	83.7	-4.08	-34.	-193.	-239.

TABLE 34. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES RCCY.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.049	15.30	99.4	15.21	98.5	14.40	97.6	13.64	141.	771.	936.
	C	0.049	18.46	99.4	18.37	98.5	17.56	97.6	16.81	170.	935.	1136.
S	SR	0.038	1.42	99.4	1.38	98.7	1.07	98.0	0.76	13.	66.	77.
	C	0.038	3.62	99.4	3.59	98.7	3.27	98.0	2.97	33.	180.	217.
W	SR	0.011	17.90	99.5	17.89	99.2	17.74	99.0	17.59	165.	921.	1127.
	C	0.011	19.48	99.5	19.47	99.2	19.32	99.0	19.17	180.	1003.	1227.
P/H	SR	0.002	-8.03	99.5	-8.03	99.5	-8.04	99.4	-8.06	-74.	-415.	-509.
R	SR	0.002	0.78	99.5	0.78	99.4	0.77	99.4	0.77	7.	40.	49.
C/S	SR	0.041	20.83	99.4	20.76	98.6	20.14	97.8	19.55	192.	1061.	1293.
	C	0.041	23.52	99.4	23.45	98.6	22.83	97.8	22.23	217.	1200.	1463.
C/W	SR	0.030	29.79	99.4	29.73	98.8	29.21	98.2	28.69	274.	1526.	1864.
	C	0.030	32.16	99.4	32.10	98.8	31.58	98.2	31.06	296.	1649.	2014.
S/W	SR	0.019	15.26	99.5	15.24	99.1	15.02	98.7	14.79	141.	783.	957.
	C	0.019	17.16	99.5	17.13	99.1	16.91	98.7	16.68	158.	881.	1077.
C/S/W	SR	0.026	7.75	99.4	7.72	98.9	7.46	98.4	7.19	71.	394.	480.
	C	0.026	9.59	99.4	9.56	98.9	9.30	98.4	9.04	88.	489.	596.

TABLE 35. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES RHBL.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.353	-3.63	97.4	-3.68	84.7	-4.05	58.5	-4.83	-34.	-197.	-246.

TABLE 36. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES RW01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.219	24.99	98.9	24.33	93.4	19.00	86.4	12.29	228.	1164.	1358.
	C	0.219	28.16	98.9	27.50	93.4	22.16	86.4	15.46	257.	1327.	1558.
S	SR	0.168	8.65	99.1	8.38	94.7	6.16	90.1	3.85	79.	394.	456.
	C	0.168	10.86	99.1	10.59	94.7	8.37	90.1	6.05	99.	508.	596.
W	SR	0.050	33.42	99.5	33.30	98.0	32.12	96.5	30.97	308.	1699.	2068.
	C	0.050	35.00	99.5	34.87	98.0	33.70	96.5	32.54	322.	1781.	2168.
P/H	SR	0.007	7.16	99.6	7.15	99.4	7.05	99.2	6.94	66.	367.	449.
R	SR	0.010	3.73	99.6	3.72	99.3	3.69	99.0	3.65	34.	192.	234.
C/S	SR	0.185	30.84	99.0	30.33	94.2	26.15	89.0	21.54	282.	1493.	1778.
	C	0.185	33.53	99.0	33.01	94.2	28.83	89.0	24.23	307.	1632.	1948.
C/W	SR	0.135	44.32	99.2	43.89	95.6	40.17	92.0	36.58	407.	2202.	2654.
	C	0.135	46.70	99.2	46.26	95.6	42.54	92.0	38.95	429.	2324.	2804.
S/W	SR	0.084	27.85	99.4	27.66	97.0	25.95	94.7	24.34	256.	1399.	1694.
	C	0.084	29.74	99.4	29.55	97.0	27.84	94.7	26.23	273.	1497.	1813.
C/S/W	SR	0.118	21.11	99.3	20.87	96.0	18.84	92.9	16.91	194.	1043.	1253.
	C	0.118	22.95	99.3	22.72	96.0	20.69	92.9	18.76	211.	1138.	1370.

TABLE 37. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES RW13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.656	15.25	97.5	13.57	73.0	-7.69	25.0	-49.39	133.	440.	77.
	C	0.656	18.42	97.5	16.74	73.0	-4.52	25.0	-46.22	162.	603.	277.
	ST	0.321	7.07	98.6	6.21	90.6	1.07	74.2	-13.04	61.	298.	264.
	PT	0.297	2.12	98.6	1.32	91.3	1.99	77.9	-9.46	16.	325.	316.
S	SR	0.505	1.42	98.0	0.76	83.3	-5.60	25.0	-30.79	10.	-52.	-203.
	C	0.505	3.62	98.0	2.97	83.3	-3.40	25.0	-28.58	30.	62.	-63.
	ST	0.247	-5.39	98.8	-5.72	92.6	-6.58	83.8	-10.31	-51.	-248.	-334.
	PT	0.228	-10.82	98.9	-11.13	93.1	-6.55	85.6	-9.62	-101.	-253.	-331.
W	SR	0.151	33.40	99.1	33.02	95.1	29.91	91.1	26.80	306.	1651.	1986.
	C	0.151	34.97	99.1	34.60	95.1	31.49	91.1	28.38	321.	1733.	2085.
	ST	0.074	28.02	99.4	27.84	97.3	27.73	95.2	26.20	258.	1489.	1809.
	PT	0.068	23.21	99.4	23.04	97.4	27.54	95.5	26.20	213.	1476.	1799.
P/H	SR	0.020	7.16	99.6	7.13	99.0	6.83	98.3	6.51	66.	363.	441.
	ST	0.010	1.42	99.6	1.41	99.3	2.81	99.0	2.71	13.	150.	186.
	PT	0.009	-3.28	99.6	-3.30	99.3	2.62	99.0	2.62	-30.	140.	180.
R	SR	0.030	3.73	99.6	3.72	98.6	3.62	97.7	3.52	34.	190.	232.
C/S	SR	0.555	20.82	97.8	19.53	80.4	6.00	25.0	-36.96	186.	824.	701.
	C	0.555	23.50	97.8	22.22	80.4	8.69	25.0	-34.27	211.	962.	871.
	ST	0.272	13.33	98.7	12.68	92.0	9.25	81.1	0.90	120.	658.	739.
	PT	0.251	8.14	98.8	7.53	92.5	9.74	83.4	2.84	72.	670.	767.
C/W	SR	0.404	38.31	98.3	37.12	87.8	27.00	56.9	-2.67	348.	1757.	1971.
	C	0.404	40.68	98.3	39.50	87.8	29.37	56.9	-0.30	370.	1879.	2121.
	ST	0.197	31.29	99.0	30.69	93.9	27.64	88.1	22.12	286.	1594.	1897.
	PT	0.182	25.94	99.0	25.38	94.3	27.91	89.2	23.13	237.	1597.	1912.
S/W	SR	0.252	23.81	98.8	23.28	92.5	19.08	83.3	12.92	217.	1130.	1328.
	C	0.252	25.70	98.8	25.18	92.5	20.97	83.3	14.81	235.	1227.	1448.
	ST	0.123	17.47	99.2	17.21	95.9	16.77	92.6	14.69	160.	943.	1133.
	PT	0.114	11.87	99.3	11.63	96.1	16.60	93.1	14.78	108.	929.	1125.
C/S/W	SR	0.353	18.37	98.5	17.71	89.5	12.36	68.4	-0.33	166.	827.	926.
	C	0.353	20.21	98.5	19.56	89.5	14.21	68.4	1.51	183.	922.	1043.
	ST	0.173	12.10	99.1	11.78	94.6	10.88	89.8	8.10	110.	655.	774.
	PT	0.160	6.49	99.1	6.18	94.9	10.72	90.6	8.32	58.	640.	765.

TABLE 38. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES SA13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.342	-3.86	98.5	-4.57	89.9	-10.37	70.6	-23.41	-39.	-332.	-498.
	C	0.342	-0.70	98.5	-1.41	89.9	-7.20	70.6	-20.25	-10.	-168.	-298.
	ST	0.180	-12.11	99.0	-12.49	94.4	-13.84	89.3	-17.19	-113.	-606.	-777.
	PT	0.172	-17.07	99.1	-17.43	94.6	-13.40	89.8	-16.43	-159.	-588.	-747.
S	SR	0.263	-12.89	98.8	-13.13	92.2	-15.01	82.1	-17.93	-120.	-710.	-896.
	C	0.263	-10.69	98.8	-10.92	92.2	-12.81	82.1	-15.72	-100.	-596.	-756.
	ST	0.139	-19.72	99.2	-19.85	95.4	-19.11	91.8	-20.09	-182.	-950.	-1173.
	PT	0.133	-25.16	99.2	-25.28	95.6	-19.25	92.2	-20.07	-233.	-956.	-1176.
W	SR	0.079	2.57	99.4	2.45	97.1	1.39	94.9	0.39	23.	109.	120.
	C	0.079	4.15	99.4	4.03	97.1	2.97	94.9	1.97	38.	190.	220.
	ST	0.042	-2.82	99.5	-2.88	98.3	-1.92	97.0	-2.44	-26.	-78.	-99.
	PT	0.040	-7.64	99.5	-7.70	98.3	-2.20	97.1	-2.62	-71.	-94.	-113.
P/H	SR	0.011	14.73	99.6	14.71	99.3	14.53	98.9	14.33	136.	756.	925.
	ST	0.006	8.99	99.6	8.98	99.5	10.44	99.3	10.39	83.	542.	667.
	PT	0.005	4.29	99.7	4.28	99.5	10.24	99.3	10.29	40.	532.	660.
R	SR	0.016	3.73	99.6	3.72	99.1	3.67	98.6	3.61	34.	191.	234.
C/S	SR	0.289	1.06	98.7	0.55	91.5	-3.59	78.9	-10.86	7.	-42.	-111.
	C	0.289	3.75	98.7	3.23	91.5	-0.91	78.9	-8.17	32.	97.	59.
	ST	0.153	-6.47	99.1	-6.75	95.1	-7.28	91.0	-9.54	-61.	-295.	-386.
	PT	0.146	-11.67	99.2	-11.94	95.3	-7.11	91.4	-9.15	-109.	-290.	-372.
C/W	SR	0.210	9.54	98.9	9.09	93.6	5.50	87.1	1.15	86.	407.	454.
	C	0.210	11.91	98.9	11.47	93.6	7.88	87.1	3.52	108.	530.	604.
	ST	0.111	2.47	99.3	2.23	96.2	1.97	93.3	0.09	22.	173.	192.
	PT	0.106	-2.89	99.3	-3.11	96.3	1.97	93.5	0.27	-28.	170.	195.
S/W	SR	0.131	-1.15	99.2	-1.33	95.6	-2.61	92.2	-4.24	-11.	-94.	-133.
	C	0.131	0.74	99.2	0.56	95.6	-0.92	92.2	-2.35	6.	3.	-14.
	ST	0.069	-7.52	99.4	-7.61	97.4	-6.64	95.4	-7.38	-70.	-314.	-390.
	PT	0.066	-13.11	99.4	-13.20	97.5	-6.95	95.6	-7.55	-121.	-330.	-404.
C/S/W	SR	0.184	4.30	99.0	4.03	94.3	1.85	89.1	-0.54	38.	170.	182.
	C	0.184	6.14	99.0	5.88	94.3	5.69	89.1	1.30	55.	266.	298.
	ST	0.097	-1.99	99.3	-2.13	96.6	-1.58	94.0	-2.69	-19.	-38.	-57.
	PT	0.093	-7.61	99.3	-7.75	96.7	-1.88	94.2	-2.85	-71.	-56.	-72.

TABLE 39. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES SA35.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
S	SR	0.547	-20.09	97.8	-20.45	80.9	-24.11	25.0	-36.20	-187.	-1106.	-1439.
	C	0.547	-17.89	97.8	-18.24	80.9	-21.91	25.0	-33.99	-167.	-992.	-1299.
	ST	0.203	-28.68	99.0	-28.82	93.8	-27.22	87.7	-28.43	-265.	-1367.	-1683.
	PT	0.180	-37.39	99.0	-37.51	94.4	-27.92	89.3	-28.75	-345.	-1407.	-1720.
W	SR	0.164	-6.70	99.1	-6.89	94.8	-8.49	90.3	-10.14	-63.	-383.	-489.
	C	0.164	-5.12	99.1	-5.31	94.8	-6.91	90.3	-8.56	-48.	-302.	-390.
	ST	0.061	-13.74	99.5	-13.81	97.6	-12.08	95.9	-12.63	-127.	-600.	-738.
	PT	0.054	-21.63	99.5	-21.70	97.9	-12.92	96.3	-13.27	-200.	-646.	-784.
P/H	SR	0.022	14.73	99.6	14.69	98.9	14.31	98.2	13.91	136.	752.	917.
	ST	0.008	7.33	99.6	7.32	99.4	9.58	99.1	9.52	68.	499.	616.
	PT	0.007	-0.45	99.6	-0.47	99.4	8.79	99.2	8.88	-4.	458.	575.
P	SR	0.033	3.73	99.6	3.71	98.5	3.61	97.5	3.50	34.	190.	232.
S/W	SR	0.273	-10.27	98.7	-10.55	91.9	-12.76	80.9	-16.35	-96.	-582.	-744.
	C	0.273	-8.38	98.7	-8.66	91.9	-10.87	80.9	-14.46	-79.	-485.	-625.
	ST	0.102	-18.39	99.3	-18.50	96.5	-16.71	93.8	-17.47	-170.	-830.	-1022.
	PT	0.090	-27.26	99.3	-27.35	96.8	-17.58	94.4	-18.11	-252.	-879.	-1071.

TABLE 40. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES SL35.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.044	-0.69	99.2	-0.70	97.0	-0.84	94.8	-0.97	-6.	-39.	-49.

TABLE 41. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES SCYL.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.170	15.27	99.1	14.97	96.5	12.72	94.2	10.69	139.	732.	872.
	C	0.170	18.44	99.1	18.13	96.5	15.89	94.2	13.86	169.	896.	1072.
S	SR	0.131	-5.76	99.2	-5.86	97.1	-6.63	95.3	-7.26	-54.	-316.	-396.
	C	0.131	-3.56	99.2	-3.66	97.1	-4.42	95.3	-5.05	-33.	-202.	-257.
W	SP	0.039	17.90	99.4	17.85	98.6	17.37	97.9	16.92	165.	913.	1114.
	C	0.039	19.48	99.4	19.42	98.6	18.95	97.9	18.50	179.	995.	1213.
P/H	SR	0.005	14.64	99.5	14.63	99.4	14.57	99.3	14.50	135.	754.	924.
R	SR	0.008	6.64	99.5	6.64	99.3	6.62	99.1	6.59	61.	342.	419.
C/S	SR	0.144	16.82	99.2	16.60	96.9	14.92	95.0	13.51	154.	827.	994.
	C	0.144	19.50	99.2	19.29	96.9	17.61	95.0	16.20	179.	966.	1164.
C/W	SR	0.105	29.77	99.3	29.58	97.5	28.02	96.0	26.74	274.	1500.	1820.
	C	0.105	32.14	99.3	31.95	97.5	30.39	96.0	29.11	296.	1622.	1970.
S/W	SR	0.065	11.26	99.3	11.19	98.1	10.53	97.1	9.96	104.	566.	686.
	C	0.065	13.15	99.3	13.08	98.1	12.43	97.1	11.85	121.	664.	806.
C/S/W	SR	0.092	12.53	99.3	12.42	97.7	11.55	96.4	10.83	115.	626.	757.
	C	0.092	14.37	99.3	14.27	97.7	13.40	96.4	12.68	132.	721.	874.
IRRIGATED CROP ROTATIONS												
C	SR	0.170	175.47	99.1	174.25	96.5	165.21	94.2	157.03	1613.	8833.	10722.
	C	0.170	183.93	99.1	182.71	96.5	173.67	94.2	165.49	1691.	9270.	11258.
S	SR	0.131	40.42	99.2	39.95	97.1	36.23	95.3	33.17	371.	1996.	2404.
	C	0.131	47.62	99.2	47.15	97.1	43.43	95.3	40.37	437.	2368.	2860.
W	SR	0.039	78.55	99.4	78.37	98.6	76.72	97.9	75.14	724.	4018.	4905.
	C	0.039	84.62	99.4	84.44	98.6	82.79	97.9	81.21	780.	4332.	5289.
C/S	SR	0.144	158.20	99.2	157.27	96.9	150.12	95.0	144.13	1455.	7992.	9714.
	C	0.144	166.03	99.2	165.10	96.9	157.96	95.0	151.96	1527.	8396.	10209.
C/S/W	SR	0.092	146.34	99.3	145.78	97.7	141.07	96.4	137.16	1347.	7444.	9069.
	C	0.092	153.51	99.3	152.95	97.7	148.25	96.4	144.33	1413.	7814.	9523.

TABLE 42. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES SY01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.228	5.66	99.0	5.31	95.8	2.83	91.8	-0.21	51.	229.	250.
	C	0.228	8.83	99.0	8.47	95.8	5.99	91.8	2.96	80.	392.	451.
S	SR	0.175	-5.77	99.1	-5.90	96.5	-6.85	94.0	-7.73	-54.	-322.	-405.
	C	0.175	-3.56	99.1	-3.69	96.5	-4.64	94.0	-5.52	-33.	-208.	-266.
W	SR	0.053	2.50	99.4	2.45	98.4	1.98	97.5	1.56	23.	118.	140.
	C	0.053	4.07	99.4	4.02	98.4	3.56	97.5	3.14	37.	200.	239.
P/H	SR	0.007	7.08	99.5	7.07	99.3	7.00	99.2	6.93	65.	364.	445.
R	SR	0.011	0.78	99.5	0.78	99.3	0.76	99.0	0.74	7.	40.	49.
C/S	SR	0.193	10.90	99.1	10.63	96.2	8.71	93.4	6.80	99.	514.	608.
	C	0.193	13.58	99.1	13.32	96.2	11.40	93.4	9.48	124.	653.	778.
C/W	SR	0.140	15.37	99.2	15.15	96.9	13.52	95.1	12.15	141.	753.	904.
	C	0.140	17.74	99.2	17.52	96.9	15.89	95.1	14.52	163.	876.	1054.
S/W	SR	0.088	2.77	99.3	2.69	97.8	1.98	96.5	1.39	25.	127.	147.
	C	0.088	4.66	99.3	4.58	97.8	3.87	96.5	3.28	43.	224.	267.
C/S/W	SR	0.123	4.43	99.2	4.31	97.2	3.38	95.5	2.62	40.	206.	242.
	C	0.123	6.27	99.2	6.15	97.2	5.22	95.5	4.46	57.	301.	359.

TABLE 43. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES SY13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.305	-13.54	98.8	-13.89	94.7	-16.26	86.3	-21.11	-126.	-759.	-965.
	C	0.305	-10.37	98.8	-10.72	94.7	-13.09	86.3	-17.95	-97.	-596.	-765.
S	SR	0.235	-12.93	99.0	-13.07	95.7	-14.01	91.5	-15.23	-120.	-692.	-860.
	C	0.235	-10.72	99.0	-10.86	95.7	-11.81	91.5	-13.02	-100.	-578.	-720.
W	SR	0.070	2.50	99.3	2.43	98.0	1.83	96.9	1.31	23.	115.	134.
	C	0.070	4.07	99.3	4.00	98.0	3.41	96.9	2.89	37.	196.	234.
P/H	SR	0.009	7.08	99.5	7.07	99.3	6.98	99.1	6.88	65.	364.	444.
R	SR	0.014	0.78	99.5	0.78	99.2	0.75	98.9	0.73	7.	40.	48.
C/S	SR	0.258	-4.92	98.9	-5.19	95.4	-7.02	90.1	-9.76	-47.	-301.	-393.
	C	0.258	-2.23	98.9	-2.50	95.4	-4.33	90.1	-7.08	-22.	-162.	-223.
C/W	SR	0.188	3.53	99.1	3.30	96.3	1.59	93.6	-0.07	32.	139.	151.
	C	0.188	5.90	99.1	5.67	96.3	3.97	93.6	2.30	53.	262.	301.
S/W	SR	0.117	-1.22	99.2	-1.32	97.3	-2.13	95.7	-2.80	-12.	-82.	-110.
	C	0.117	0.67	99.2	0.57	97.3	-0.24	95.7	-0.90	6.	15.	9.
C/S/W	SR	0.164	1.74	99.1	1.59	96.6	0.50	94.4	-0.47	15.	63.	64.
	C	0.164	3.58	99.1	3.44	96.6	2.34	94.4	1.39	32.	158.	181.

TABLE 44. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES TFSD.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
R	SR	0.026	0.78	99.4	0.77	98.9	0.74	98.4	0.70	7.	39.	48.

TABLE 45. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES US01.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.128	44.25	99.2	43.78	95.7	39.76	92.4	35.91	406.	2191.	2637.
	C	0.128	47.42	99.2	46.95	95.7	42.93	92.4	39.08	435.	2355.	2837.
S	SR	0.098	37.38	99.3	37.13	96.6	34.94	94.0	32.87	344.	1879.	2277.
	C	0.098	39.58	99.3	39.33	96.6	37.14	94.0	35.08	364.	1993.	2416.
W	SR	0.029	18.00	99.6	17.95	98.7	17.38	97.7	16.80	166.	917.	1117.
	C	0.029	19.58	99.6	19.52	98.7	18.96	97.7	18.37	180.	998.	1217.
P/H	SR	0.004	7.16	99.7	7.16	99.5	7.10	99.4	7.03	66.	368.	451.
R	SR	0.006	12.54	99.6	12.53	99.5	12.50	99.3	12.46	116.	646.	792.
C/S	SR	0.108	58.69	99.3	58.30	96.3	54.33	93.4	51.55	540.	2950.	3574.
	C	0.108	61.38	99.3	60.98	96.3	57.51	93.4	54.24	564.	3089.	3744.
C/W	SR	0.079	47.69	99.4	47.42	97.1	45.03	95.0	42.76	439.	2408.	2922.
	C	0.079	50.06	99.4	49.79	97.1	47.40	95.0	45.13	460.	2530.	3072.
S/W	SR	0.049	35.35	99.5	35.22	98.0	34.07	96.6	32.92	325.	1799.	2190.
	C	0.049	37.24	99.5	37.11	98.0	35.96	96.6	34.81	343.	1897.	2310.
C/S/W	SR	0.069	26.28	99.4	26.13	97.4	24.76	95.5	23.45	242.	1326.	1608.
	C	0.069	28.12	99.4	27.97	97.4	26.60	95.5	25.29	259.	1421.	1725.

TABLE 46. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES US13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.306	24.96	98.6	24.05	91.0	16.70	76.5	2.71	226.	1118.	1262.
	C	0.306	28.13	98.6	27.22	91.0	19.87	76.5	5.88	255.	1281.	1462.
	ST	0.168	16.73	99.1	16.21	94.7	13.77	90.1	9.41	152.	857.	1003.
	PT	0.163	11.77	99.1	11.27	94.8	14.20	90.4	10.11	106.	875.	1033.
S	SR	0.236	30.17	98.8	29.64	92.9	25.38	84.9	19.61	276.	1457.	1729.
	C	0.236	32.38	98.8	31.85	92.9	27.59	84.9	21.81	296.	1571.	1869.
	ST	0.130	23.35	99.2	23.06	95.7	22.33	92.3	19.97	214.	1240.	1494.
	PT	0.126	17.92	99.2	17.63	95.8	22.23	92.5	20.04	164.	1232.	1492.
W	SR	0.071	18.00	99.4	17.85	97.4	16.58	95.4	15.35	165.	900.	1088.
	C	0.071	19.57	99.4	19.43	97.4	18.15	95.4	16.93	180.	982.	1187.
	ST	0.039	12.61	99.5	12.53	98.3	13.35	97.1	12.67	116.	715.	871.
	PT	0.038	7.79	99.5	7.71	98.4	13.06	97.2	12.48	72.	699.	857.
P/H	SR	0.009	7.16	99.6	7.15	99.3	7.00	99.0	6.85	66.	367.	447.
	ST	0.005	1.42	99.7	1.42	99.5	2.89	99.3	2.86	13.	152.	189.
	PT	0.005	-3.28	99.7	-3.29	99.5	2.69	99.3	2.76	-30.	142.	182.
R	SR	0.014	12.53	99.6	12.53	99.2	12.44	98.7	12.35	116.	645.	790.
C/S	SR	0.259	42.80	98.8	42.00	92.3	35.57	82.5	25.83	391.	2058.	2435.
	C	0.259	45.49	98.8	44.69	92.3	38.26	82.5	28.52	416.	2197.	2605.
	ST	0.143	35.28	99.2	34.83	95.3	32.84	91.6	29.18	323.	1826.	2197.
	PT	0.138	30.08	99.2	29.65	95.5	33.01	91.8	29.58	275.	1831.	2211.
C/W	SR	0.188	35.80	99.0	35.25	94.2	30.71	88.7	25.65	328.	1741.	2077.
	C	0.188	38.18	99.0	37.62	94.2	33.08	88.7	28.02	350.	1863.	2227.
	ST	0.104	28.74	99.3	28.43	96.4	27.53	93.7	25.05	264.	1515.	1828.
	PT	0.101	23.39	99.3	23.08	96.5	27.51	93.8	25.20	214.	1511.	1832.
S/W	SR	0.118	31.34	99.3	31.06	96.0	28.65	92.9	26.37	288.	1562.	1885.
	C	0.118	33.23	99.3	32.95	96.0	30.54	92.9	28.26	305.	1660.	2005.
	ST	0.065	24.98	99.4	24.82	97.5	25.22	95.7	23.92	230.	1351.	1643.
	PT	0.063	19.38	99.4	19.23	97.6	24.92	95.8	23.76	178.	1334.	1630.
C/S/W	SR	0.165	23.57	99.1	23.23	94.8	20.40	90.3	17.49	216.	1150.	1375.
	C	0.165	25.41	99.1	25.07	94.8	22.25	90.3	19.33	233.	1245.	1492.
	ST	0.091	17.28	99.3	17.09	96.8	17.22	94.3	15.71	159.	947.	1145.
	PT	0.088	11.66	99.4	11.48	96.8	16.91	94.5	15.54	107.	930.	1130.

TABLE 47. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES VS13.

		PERCENT	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR								PRESENT VALUE OF A PROFIT STREAM TO YEAR		
ROT.	CP	TOPSOIL LOST/YR	YR 1		YEAR 10		YEAR 100		YEAR 200		10	100	200
R	SR	0.022		0.78	99.4	0.77	99.0	0.74	98.5	0.71	7.	39.	48.

TABLE 48. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES VECX.

		PERCENT	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR								PRESENT VALUE OF A PROFIT STREAM TO YEAR		
ROT.	CP	TOPSOIL LOST/YR	YR 1		YEAR 10		YEAR 100		YEAR 200		10	100	200
R	SR	0.034		0.78	99.4	0.77	98.8	0.72	98.1	0.68	7.	39.	47.

TABLE 49. YIELD LOSS AND PER ACRE RETURN TO LAND AND MANAGEMENT FOR SOIL SERIES WC13.

ROT.	CP	PERCENT TOPSOIL LOST/YR	THE YIELD REMAINING (AS A % OF THE INITIAL YIELD) AND THE YEARLY RETURN TO LAND AND MANAGEMENT FOR YR 1	YEAR 10		YEAR 100		YEAR 200		PRESENT VALUE OF A PROFIT STREAM TO YEAR 10	100	200
C	SR	0.365	-13.47	98.4	-14.12	89.2	-19.48	66.1	-32.82	-127.	-816.	-1089.
	C	0.365	-10.31	98.4	-10.95	89.2	-16.31	66.1	-29.66	-98.	-653.	-889.
S	SR	0.280	-20.07	98.7	-20.26	91.7	-21.77	80.0	-24.30	-186.	-1072.	-1335.
	C	0.280	-17.87	98.7	-18.06	91.7	-19.56	80.0	-22.09	-166.	-958.	-1195.
W	SR	0.084	-12.85	99.4	-12.94	97.0	-13.68	94.7	-14.39	-119.	-681.	-843.
	C	0.084	-11.28	99.4	-11.36	97.0	-12.11	94.7	-12.81	-104.	-599.	-744.
P/H	SR	0.011	7.16	99.6	7.14	99.3	6.97	98.9	6.79	66.	366.	446.
R	SR	0.017	2.26	99.6	2.25	99.1	2.21	98.5	2.16	21.	116.	141.
C/S	SR	0.309	-8.86	98.6	-9.31	90.9	-12.97	76.2	-20.02	-84.	-542.	-719.
	C	0.309	-6.17	98.6	-6.62	90.9	-10.28	76.2	-17.33	-59.	-404.	-549.
C/W	SR	0.224	-4.88	98.9	-5.25	93.2	-8.24	85.9	-12.08	-47.	-323.	-434.
	C	0.224	-2.51	98.9	-2.88	93.2	-5.87	85.9	-9.71	-25.	-200.	-284.
S/W	SR	0.140	-13.66	99.2	-13.79	95.4	-14.88	91.7	-15.95	-127.	-731.	-909.
	C	0.140	-11.77	99.2	-11.90	95.4	-12.99	91.7	-14.06	-109.	-633.	-789.
C/S/W	SR	0.196	-6.50	99.0	-6.72	94.0	-8.48	88.2	-10.50	-61.	-377.	-485.
	C	0.196	-4.66	99.0	-4.88	94.0	-6.64	88.2	-8.66	-44.	-282.	-368.