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The Economics of Soil and Water Conservation Practices in Iowa: Results and Discussion

the center for agricultural and rural development
iowa state university | ames, iowa 50011

THE ECONOMICS OF SOIL AND WATER CONSERVATION PRACTICES IN IOWA: RESULTS AND DISCUSSION*

by

C. Arden Pope III
Shashanka Bhide
Earl O. Heady**

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**Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa 50011. Other persons who helped in the preparation of this document are Darold Ackridge, Timm Banks, Aasha Kapur, David Krog, and LeAnn McGranahan.

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PREFACE

The magnitude of the soil erosion problem and the important role that economic factors play in the adoption of conservation practices have prompted an extensive research effort to examine the economics of soil and water conservation practices in Iowa. The study was conducted by the Center for Agricultural and Rural Development (CARD) in the Iowa Agricultural and Home Economics Experiment Station at Iowa State University in cooperation with the Iowa Department of Soil Conservation and the Cooperative Extension Service in order to provide guidance in planning and implementing cost-effective control for Iowa's soil erosion and non-point water pollution problems. The scope of this effort resulted in several related studies and subsequent reports. The following reports are being published as a series of five CARD Reports:

I. The Economics of Soil and Water Conservation Practices in Iowa: Model and Data Documentation (Pope, Bhide, and Heady, 1982).

II. The Economics of Soil and Water Conservation Practices in Iowa: Results and Discussion (Pope, Bhide, and Heady, 1983).

III. A Dynamic Analysis of Economics of Soil Conservation: An Application of Optimal Control Theory (Bhide, Pope, and Heady, 1982).

IV. Effects of Tenure Arrangements, Capital Constraints, and Farm Size on the Economics of Soil and Water Conservation Practices in Iowa (Banks, Bhide, Pope, and Heady, 1983).

V. Effects of Livestock Enterprises on the Economics of Soil and Water Conservation Practices in Iowa (Krog, Bhide, Pope, and Heady, 1983).

The first report of this series describes and documents the basic methodology, data, and assumptions used in these related studies. Methodology, data, and assumptions specific to an individual study are given in the corresponding report.

I. INTRODUCTION

The level of soil erosion and water quality, the amount and quality of wildlife habitat, the present and future productivity of Iowa farmland, and other important issues associated with Iowa agriculture are significantly influenced by the soil and water conservation practices used by Iowa farmers. The extent to which these practices are adopted by most farmers greatly depends upon economic, as well as social, environmental, and other factors.

Although many farmers are highly concerned about soil and water conservation, they must make their farms economically viable operations. Iowa farmers, generally, do not behave as if they hold land in trust for society. They are motivated by economic factors as are entrepreneurs in other sectors of the economy. Farmers must adopt soil and water conservation practices within the framework of economic constraints imposed upon them by a highly competitive profession.

The economic framework from which farmers must function changes over time. Before the mid-1800s, when most of the natural vegetation was undisturbed by farming, there was relatively little accelerated soil erosion in Iowa. In the latter half of the 1800s, most of Iowa was settled and converted into farms. These were mostly small subsistence farms using unintensive cropping systems. Drainage was considered a more serious problem than soil erosion by most farmers.

In the period between 1900-1920, farm commodity prices rose steadily. Land prices followed. Iowa agriculture gradually became more commercial, intensive, and erosive.

Between 1921-1940, concern about soil erosion increased. The Soil Conservation Service (SCS) was established in 1933. Soil conservation practices such as contouring, strip cropping, and terracing were vigorously promoted in Iowa. However, also during this period, farmers experienced serious economic difficulties. Foreclosure rates were high. Areas of highest erosion in southern and western Iowa were areas where foreclosures were especially high (Murray, 1967). Economic difficulties certainly limited the adoption of conservation practices during this period.

From the 1940s to the 1980s, economic conditions that exacerbated the soil erosion problem prevailed. Agriculture in Iowa became more commercial and intensive. Erosive row crops, especially corn and soybeans, became comparatively more profitable. It became more economical to use larger machinery, making fields larger and making contouring, strip cropping, and terracing less attractive. The price of land also continued to rise during this period. Farmers, in the long run, were required to farm in a highly commercial and intensive fashion to simply cover the growing costs of land and other inputs. Despite the efforts of SCS and other public and private organizations, this resulted in serious and unprecedented rates of soil erosion.

Today, erosion in Iowa remains seriously high on many Iowa soils. Some soil erosion from the action of wind and water is inevitable.

However, when the level of erosion exceeds the rate at which new soil can be created, soil erosion becomes a threat to long-term productivity (See Bhide, Pope, and Heady, 1982). On most soils in Iowa, a tolerance level of about four or five tons of annual soil loss per acre is regarded as acceptable because the soil loss per acre is regarded as acceptable because the soil can replace itself through natural processes. However, in Iowa, average annual soil loss is estimated at being at least twice as much as is acceptable (U.S. Department of Agriculture, 1981a). In some parts of the state it is much higher. This erosion has resulted in reducing water quality as high levels of sediment enter into streams, rivers, lakes, and reservoirs.

Therefore, the following questions are raised: What practices are available to help control soil erosion in Iowa? Which practices are more effective and more efficient across different soil characteristics and farming situations? What policies can be implemented to promote the use of these practices? How will farmers' profits be affected if soil erosion is held to acceptable levels? This study attempts to address these and other similar questions. In general, the objective of this study is to evaluate soil and water conservation practices in Iowa under various economic environments and across various farm situations with differing soil resources and economic characteristics.

II. METHODOLOGY AND SELECTED SCENARIOS

Linear programming (LP) models that maximize before-tax net returns to land, labor, and management have been built for 18 representative farms throughout Iowa. The representative farms are defined in terms of soil resources such that the farms and soil situations represent typical and extreme conditions with respect to soils and erosion problems in Iowa, and such that they range over enough conditions so that the major economic problems in attaining reduced soil erosion and application of soil conservation practices can be studied. The 18 general farm locations are shown in Figure 1 and a description of the soil make-up of each of the farms is given in Table 1.

The LP models incorporate five tillage systems, three supporting practices, and 15 crop rotations on three to five soil mapping units (SMUs). The five tillage systems included are the conventional fall moldboard plow, spring-disk, chisel-plow, till-plant, and slot-plant systems. The supporting practices included are contouring, strip cropping, and terracing. The crop rotations include combinations of corn grain (C), corn silage (S), soybeans (B), oats (O), alfalfa (M), and pasture (P).

Data needed to build the models are collected from a large variety of sources. Soil loss for the many different soils and management system is estimated using the Universal Soil Loss Equation (Wischmeier and Smith). The costs of the various cropping activities are estimated by constructing cost budgets for all combinations of crop rotations and tillage

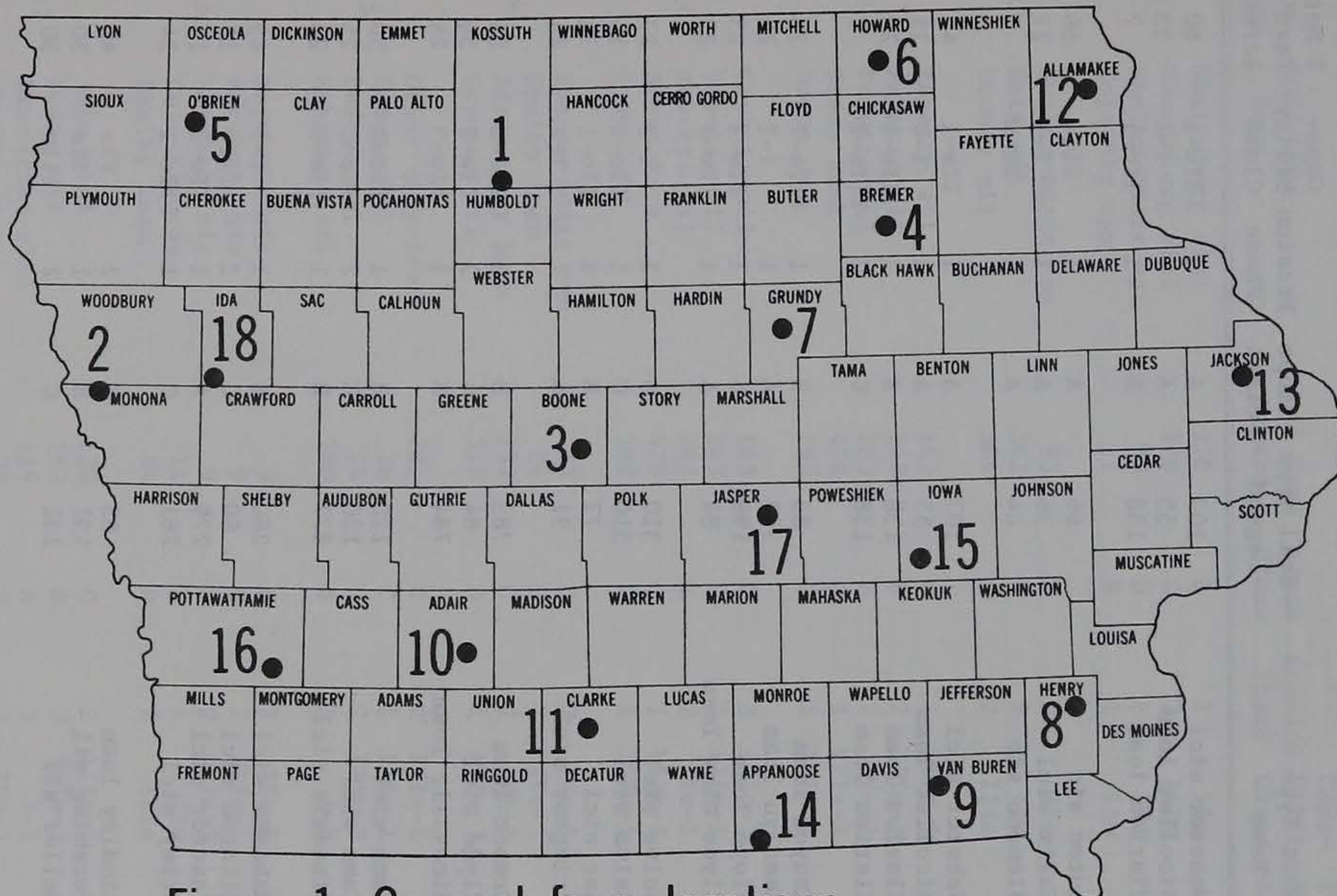

Figure 1. General farm locations

Table 1. Description of soils in farms 1-18

Farm Number	Soil Type Name	Soil Type Legend	Slope Class	Erosion Phase	Capa-bility Class	% Net Farm Acres	Acres of SMU
	Webster sicl	107	A	1	IIw-1	60	210
1	Nicollet loam	55	A	1	I-1	33	116
	Clarion loam	138	B	1	IIe-1	7	24
	Luton sic	66	A	1	IIIw	66	343
2	Salix sicl	36	A	1	I-1	27	140
	Blencoe sic	44	A	1	II-w	7	37
	Webster sicl	107	A	1	IIw-1	45	144
3	Nicollet loam	55	A	1	I-1	25	80
	Clarion loam	138	B	1	IIe-1	23	74
	Clarion loam	138	C	2	IIIe-1	7	22
	Kenyon loam	83	B	1	IIIe-1	28	98
4	Readlyn loam	399	A	1	I-2	26	90
	Floyd loam	198	B	1	IIw-1	23	81
	Clyde clay loam	84	A	1	IIw-1	23	81
	Galva sicl	310	B	1	I-2	27	86
5	Galva sicl	310	C	1	IIe-2	15	48
	Sac sicl	77	B	1	IIe-1	34	109
	Primghar sicl	91	A	1	I-1	24	77
	Cresco loam	783	B	1	IIe-2	25	45
6	Clyde sicl	84	A	1	IIw-1	50	90
	Riceville loam	784	B	1	IIw-3	25	45
	Tama sicl	120	B	1	IIe-1	50	160
7	Tama sicl	120	C	2	IIIe-1	25	80
	Dinsdale sicl	377	B	1	IIe-1	25	80
	Mahaska sicl	280	B	1	I-1	45	140
8	Clinton sicl	80	C	2	IIIe	15	47
	Taintor sicl	279	A	1	IIw-2	15	47
	Otley sicl	281	C	1	IIIe-1	24	76
	Lindley loam	65	E	2	VIe	40	144
9	Pershing sil	131	B	1	IIe	30	108
	Weller sil	132	C	2	IIIe	30	108

Table 1 (continued)

Farm Number	Soil Type Name	Soil Type Legend	Slope Class	Erosion Phase	Capa-bility Class	% Net Farm Acres	Acres of SMU
10	Sharpsburg sicl	370	B	1	IIe	16	56
	Sharpsburg sicl	370	C	2	IIIe	24	84
	Shelby-Adair cpx	93	D	2	IVe	46	161
	Colo-Ely cpx	11	B	1	IIw	14	49
11	Shelby-Adair cpx	93	D	2	IVe	55	248
	Haig sil	362	A	1	IIw	25	112
	Grundy sil	364	C	2	IIIe	20	90
12	Fayette sil	163	C	1	IIIe-1	10	40
	Fayette sil	163	D	2	IIIe-3	25	100
	Fayette sil	163	E	2	IVe-1	7	28
	Steep Rock	478	G	1	VIIs-1	28	112
	Downs sil	162	C	1	IIIe-1	30	120
13	Fayette sil	163	C	2	IIIe-1	28	59
	Fayette sil	163	D	2	IIIe-1	32	67
	Fayette sil	163	E	2	IVe-1	25	52
	Steep Rock	478	G	1	VIIs-1	8	17
	Downs sil	162	C	1	IIIe-1	7	15
14	Shelby-Adair cpx	93	D	2	IVe-5	20	60
	Shelby loam	24	E	2	IVe-1	25	75
	Adair clay loam	192	C	2	IVe-2	25	75
	Seymour sil	312	B	1	IIIe-3	30	90
15	Otley clay-loam	281	C	2	IIIe-1	48	187
	Ladoga sil	76	C	2	IIIe-1	14	55
	Ladoga sil	76	D	2	IIIe-3	14	55
	Mahaska sicl	280	B	1	I-1	24	93
16	Marshall sic	9	B	1	IIe-1	19	61
	Marshall sic	9	C	2	IIIe-1	19	61
	Marshall sic	9	D	2	IIIe-2	37	118
	Colo-Ely cpx	11	B	1	IIw	18	58
	Shelby loam	24	D	2	IIIe	7	22
17	Tama sicl	120	C	2	IIIe-1	60	204
	Downs sil	162	D	2	IIIe-3	20	68
	Muscatine sicl	119	A	1	I-1	10	34
	Shelby loam	24	E	2	IVe-1	10	34

Table 1 (continued)

Farm Number	Soil Type Name	Soil Type Legend	Slope Class	Erosion Phase	Capa- bility Class	%Net Farm Acres	Acres of SMU
	Ida sil	1	D	3	IIIe	15	47
	Ida sil	1	E	3	IVe	30	93
18	Monona sil	10	C	2	IIe	18	56
	Monona sil	10	D	2	IIIe	17	52
	Napier sil	12	C	1	IIIe	20	62

systems. These costs are adjusted for different soils, supporting practices, and yields. Cost budgets are also developed for each of the activities in the livestock sectors of the models. Property taxes are not included in the costs. Therefore, it is assumed that land can be idled at no cost.

Application rates, and means of application of such inputs as nitrogen fertilizer, insecticides, and herbicides are based upon recommendations from agronomists, integrated pest management specialists, and weed scientists. The rates of phosphorus and potassium fertilizer applied to the crops are assumed to be the amount needed to maintain present soil fertility.

Data on prices of inputs and outputs are collected. The prices of corn grain, soybeans, oats, and alfalfa are adjusted to reflect historic (1976-1980) relationships between the different crops. Livestock prices are similarly adjusted to reflect price relationships over the time period 1971-1980. All prices used in the study are in 1980 dollars.

Yield data for all the soils in the models are collected and adjusted to reflect 1980 yields. Time series data on yields from 1950-1980 are also collected. By using a three stage square regression model that incorporates weather variables, nitrogen application rates, and technology trends for all the crops, yields for 1985-2020 are projected. There is no consistent evidence that, given proper management, there will be a significant difference in yields across tillage system or supporting practices. However, projected 2020 yields for each management system and on each soil are adjusted downward by an erosion factor based on the total soil erosion that would have occurred under that system between 1985 and 2020. In addition, corn yields during the first year following meadow or soybeans are adjusted upward by 7 percent. For a complete description and documentation of the models and data, see Pope, Bhide, and Heady (1982b).

The LP models are run under 16 selected scenarios that incorporate various assumptions about the farmers' willingness or ability to use conservation practices, the availability of markets for roughages, soil loss subsidies, soil loss constraints, terrace subsidies, and livestock operations (Table 2). The first 13 scenarios are solved for the year 1985. These scenarios are succinctly described as follows.

Scenario 1 assumes strictly cash crop farms. All crops except corn silage can be sold. The objective of the farmer is to maximize 1985 net returns to land, labor, and management with total disregard to soil erosion and other environmental factors. It is also assumed that the farmer is either unwilling or unable to use conservation tillage or supporting practices. The models for each farm, under this scenario, are constrained such that no supporting practices such as terracing, contouring, or strip cropping can be used, and only the conventional tillage system can be used. However, any of the specified crop rotations can be used.

Scenario 2 assumes strictly cash grain farms. Only corn grain, soybeans, and oats can be grown and sold. The objective of the farmer is to maximize 1985 net returns with total disregard to soil erosion and other environmental factors. However, it is assumed that the farmer is

Table 2. Descriptions of the 16 scenarios

Scenario	Crop Enterprises	Livestock Enterprises	Year	Special conditions or restrictions
1	Cash crop	none	1985	No supporting practices or conservation tillage
2	Cash grain	none	1985	none
3	Cash crop	none	1985	none
4	Cash grain	none	1985	Soil erosion cannot exceed T-values
5	Cash crop	none	1985	Soil erosion cannot exceed T-values
6	Cash crop	none	1985	Soil loss tax at $0.50/ton
7	Cash crop	none	1985	Soil loss tax of $1.00/ton
8	Cash crop	none	1985	Soil loss tax of $3.00/ton
9	Cash crop	none	1985	Soil erosion cannot exceed T-values, 50 percent subsidy on terrace installation
10	Cash grain	cow-calf and/or feeder steers	1985	none
11	Cash grain	cow-calf and/or feeder steers	1985	Soil erosion cannot exceed T-values
12	Cash grain	farrow-finish	1985	none
13	Cash grain	farrow-finish	1985	Soil erosion cannot exceed T-values
14	Cash crop	none	2020	No supporting practices or conservation tillage
15	Cash crop	none	2020	none
16	Cash crop	none	2020	Soil erosion cannot exceed T-values

willing and able to use soil and water conservation practices if they increase single-year profits by some combination of reducing costs and/or increasing revenues. The models, therefore, under this scenario, allow all combinations of crop rotations, tillage systems, and supporting practices to be used.

Scenario 3 assumes cash crop farms. All crops except silage can be sold. The objective of the farmer is to maximize 1985 net returns with total disregard for soil erosion and other environmental factors. However, all combinations of crop rotations, tillage systems, and supporting practices can be used.

Scenario 4 assumes strictly cash grain farms. Only corn grain, soybeans, and oats can be grown and sold. The objective of the farmer is to maximize 1985 net returns subject to either a government or self-imposed constraint that soil movement, as measured by the Universal Soil Loss Equation (USLE), on any given acre cannot exceed tolerance values (T-values). Only combinations of crop rotations, tillage systems, and supporting practices that meet this constraint can be employed.

Scenario 5 assumes strictly cash crop farms. All crops except silage can be sold. The objective of the farmer is to maximize 1985 net returns subject to a constraint that soil movement, as measured by USLE, on an given acre cannot exceed T-values. Only combinations of crop rotations, tillage systems, and supporting practices that meet this constraint can be employed.

Scenarios 6, 7, and 8 also assume cash crop farms and that all crops except silage can be sold. The objective of the farmer in Scenarios, 6, 7, and 8 is to maximize 1985 net returns after a tax of 0.50, 1.00, and 3.00 dollars, respectively, on each ton of soil movement as measured by USLE. Any combination of crop rotations, tillage systems, and supporting practices can be employed.

Scenario 9 assumes strict cash crop farms and that all crops except silage can be sold. The farmer's objective is to maximize 1985 net returns subject to either a government or self-imposed constraint that soil movement, as measured by USLE, on any given acre cannot exceed T-values. Also, 50 percent of the initial installation cost of terracing is assumed to be shared by the government. This means that the farmer must pay only 50 percent of the initial installation costs of terracing but all of the yearly maintenance and repair costs. Any combination of crop rotation, tillage systems, and supporting practices can be employed that meet the constraints.

Scenario 10 assumes that the farms, in addition to growing crops, also raise beef cattle. The farmer can have a cow-calf operation and/or he can feed and finish out steer calves. The feeder steer operation is constrained to no more than 600 steers per year. Various rations of corn grain, corn silage, alfalfa hay, and pasture can be fed. Corn grain, soybeans, and oats can be sold. Corn silage, alfalfa hay, pasture, and straw cannot be sold but must be utilized in cattle operations. The objective of the farmer is to maximize 1985 net returns with total disregard of soil erosion. Any combination of crop rotations, tillage systems, and supporting practices can be utilized.

Scenario 11 is exactly the same as Scenario 10 except that soil movement, as measured by USLE, on any given soil mapping unit, cannot exceed T-values. Only combinations of crop rotations, tillage systems, and supporting practices that meet this constraint can be employed.

Scenario 12 assumes that the farms, in addition to growing crops, also raise hogs. The farmer can have a farrow-finish hog operation of up to 120 litters per year. Corn grain, soybeans, and oats can be sold. Corn silage, alfalfa hay, pasture, and straw cannot be sold but must be utilized in the hog operation. The objective of the farmer is to maximize 1985 net returns with total disregard to soil erosion. Any combination of crop rotations, tillage systems, and supporting practices can be utilized.

Scenario 13 is exactly the same as Scenario 12 except that soil movement, as measured by USLE, on any given acre cannot exceed T-values. Only combinations of crop rotations, tillage systems, and supporting practices that meet this constraint can be employed.

The last three scenarios are solved for the year 2020. Scenarios 14, 15, and 16 assume cash crop farms. All crops except corn silage can be sold. The objective of the farmer is to maximize 2020 net returns. However, 2020 yields and returns are partially dependent on past soil erosion. In these scenarios, 2020 yields for the different management systems are based upon the assumption that the system was used continuously from 1985 to 2020. Yields and profits of each management system are adjusted for soil erosion.

Scenario 14 assumes that the farmer is either unwilling or unable to use any special soil and water conservation practices. Therefore, no supporting practices such as terracing, controuring, or strip cropping can be used, and only the conventional tillage system can be used.

Scenario 15 assumes that any combination of crop rotation, tillage system, and supporting practice that maximizes 2020 profits can be used.

Scenario 16 assumes that there is either a government or self-imposed constraint that soil movement, as measured by USLE, on any given acre, cannot exceed T-values. Only combinations of crop rotations, tillage systems, and supporting practices that meet this constraint can be employed.

III. RESULTS OF THE SELECTED SCENARIOS

The results of the models for the 18 farms under the 16 selected scenarios are summarized in Appendices A, B, and C. The net returns, soil loss, and optimal rotation, tillage system, and supporting practices for each soil mapping unit (SMU), in each farm, and under each scenario are reported in Appendix A. Production costs and returns under each scenario for each farm are reported in Appendices B and C. Also, range analyses, to examine the sensitivity of the models to costs and prices, are reported in Appendix B for selected activities of farms in Boone, Van Buren, Jasper, and Ida counties.

Profit Maximizing Management Practices

In Scenario 1, it is assumed that the farmers want to maximize net returns with total disregard to soil erosion and other environmental factors. Furthermore, they are either unwilling or unable to use conservation tillage systems, terracing, contouring, or strip cropping. Upon studying the solutions of each farm for this scenario, it is evident that the most profitable crop rotation is the corn-soybean rotation. Only on highly erosive and nonproductive soils is it more profitable to grow pasture or alfalfa than corn and soybeans in rotation.

The corn-soybeans rotation is also the most erosive crop rotation common to Iowa. Under Scenario 1, even on SMUs of only 2 to 5 percent slope, average soil erosion is between 7.33 and 12.42 tons per acre per year. On SMUs with even steeper slopes, the level of soil erosion is even worse. Average soil erosion, on some of the more erosive soils under this scenario, reach levels of well over 100 tons per acre per year. These levels of soil erosion certainly endanger future productivity of the soils.

Scenario 2 assumes that the farmers grow only cash grain crops. No pasture or alfalfa can be grown. In Scenario 3, pasture and alfalfa can be sold. In both scenarios the farmers are assumed to be willing and able to use any conservation practice as long as net returns are maximized. The only real difference between these two scenarios is that in Scenario 3 it is assumed that there are off-farm livestock operations that will buy and utilize the alfalfa and/or pasture that the farmers grow. In Scenario 2, it is assumed that no such market for alfalfa hay or pasture exists. Under these scenarios, the corn-soybeans rotation remains the most profitable crop rotation. However, when the farmers are willing and able to use conservation tillage, because of the reductions in capital, fuel, and other costs, the till-plant tillage system generally becomes the most cost efficient and profitable tillage system throughout Iowa. On slopes steeper than 5 percent, contouring is also used in conjunction with till-planting.

Soil erosion under these scenarios is greatly reduced as compared with Scenario 1 with no reductions in farm profits. Farms in Iowa differ greatly in terms of levels of absolute erosiveness and profitability. However, they are fairly uniform across the state in terms of the relative profitability of various management systems. For example, estimated per acre labor requirements, costs, net returns, and soil erosion on Tama silty clay loam, 5 to 9 percent slope, erosion phase two, under these crop rotations are reported in Table 3. Although the absolute values are not the same as shown for other SMUs in Iowa, the relative relationships reported in Table 3 are similar for most other agriculturally productive SMUs in Iowa that are included in this study. It is noted that soil erosion, along with labor requirements, capital, fuel, and other costs are generally less under conservation tillage systems than under the conventional fall moldboard plow system.

Effects of Constraining Soil Erosion to T-limits

T-values have been specified as the "maximum soil loss that can be tolerated and still achieve the degree of conservation needed to sustain economic production in the foreseeable future with present technology" (Bender, 1962). Therefore, in this sense, in order to maintain the productivity of the soil indefinitely, only such practices that result in levels of soil erosion that are less than or equal to T-values should be used. (T-values are three to five tons per acre per year on all the soils used in this study.) In Scenarios 4 and 5, soil erosion is constrained to T-values. Scenario 4 assumes strictly cash grain farms. Scenario 5 assumes cash crop farms where alfalfa and pasture can be grown and sold as well as cash grains. In both scenarios, only combinations of practices that result in soil erosion less than T-values can be used.

The adjustments, that farmers must make to meet the T-value constraint, depend on the erosiveness of the farm and whether or not the farm can sell

Table 3. Per acre labor requirements, costs, net returns, and soil erosion on Tama silty clay loam, 5 to 9 percent slope, erosion phase two, under three crop rotations

Rotation and Tillage System	Labor Requirements	Cost of Capital	Herbicide and Insecticide Cost
	(hours)	(dollars)	(dollars)
1. Continuous Corn			
Fall plow	2.89	25.08	28.65
Chisel plow	2.66	22.85	28.65
Spring disk	2.27	19.95	28.65
Till-plant[a]	2.29	18.83	28.65
Slot-plant[a]	2.06	16.84	34.15
2. Corn-Soybeans			
Fall plow	2.50	21.28	18.45
Chisel plow	2.33	19.24	18.45
Spring disk	2.08	17.99	18.45
Till-plant	2.07	16.87	18.45
Slot-plant	1.95	15.81	23.95
3. Corn-Corn-Oats-Meadow-Meadow			
Fall plow	2.93	22.01	11.46
Chisel plow	2.86	21.27	11.81
Spring disk	2.77	20.99	11.81
Till-plant	2.85	19.92	11.81
Slot-plant	2.73	18.79	15.11

[a]Till-plant and slot-plant tillage systems are assumed to be on contour for this soil.

Fertilizer Cost	Fuel Cost	Other Costs	Total Cost	Net Returns	Soil Erosion
(dollars)	(dollars)	(dollars)	(dollars)	(dollars)	(tons)
46.03	30.91	96.41	227.08	144.11	36
46.03	28.85	93.72	219.90	151.29	27
46.03	26.83	89.85	211.31	159.88	21
46.03	26.34	88.48	208.33	162.87	12
46.03	25.39	86.30	208.71	162.48	3
30.69	20.90	77.05	168.37	213.57	47
30.69	19.49	74.35	162.22	219.72	39
30.69	18.04	73.00	158.17	223.77	32
30.69	17.50	71.61	155.12	226.82	28
30.69	17.00	70.64	158.09	223.85	8
38.24	19.89	64.87	156.47	182.42	10
38.24	19.29	63.89	154.50	184.38	9
38.24	18.82	63.55	153.41	185.47	8
38.24	18.71	62.25	150.93	187.96	5
38.24	18.19	61.01	151.34	187.55	3

alfalfa and pasture. When the soils on the farm are almost level and the corn-soybean rotation under the till-plant system does not result in soil loss that exceeds T-values, no adjustments must be made. As the farms get progressively more erosive, farmers begin to till-plant more on the contour, then they switch to the slot-plant systems on the contour, and finally they resort to planting less intensive crop rotations, using strip cropping, terracing, and leaving extremely erosive land idle. In Scenario 4, where pasture and alfalfa hay cannot be sold, more steep land is left idle than in Scenario 5; whereas, in Scenario 5, alfalfa and pasture are grown on slopes that would otherwise have soil erosion greater than T-values.

As the farms get more erosive, the negative effects of the soil loss constraint on farm profits are greater. Also, these effects are greater on farms that are not able to sell alfalfa and/or pasture. For example, on the Jasper County farm, net returns fall by about 38 percent in Scenario 4, but by only about 14 percent in Scenario 5 when compared to Scenario 3.

It is noted that on some highly erosive soils, soil erosion as measured by the USLE in slightly higher than T-values even when only permanent pasture is grown. If these soils were terraced and utilized as permanent pasture, soil loss generally would be reduced below T-values but have negative net returns. Therefore, when the T-value constraint is imposed upon the models, nothing is grown on these highly erosive soils. This does not imply that these soils should not be used entirely; it only illustrates that on some of the most erosive soils in Iowa profitable agricultural production may not be possible if soil erosion is to be constrained to T-values. In some cases, pasture should be maintained on these soils, even if erosion is slightly higher than T-values. Also, in many cases, these soils could serve as areas of wildlife habitat.

Effects of Taxing Soil Loss

Economic theory has long recognized that one of the imperfections of a free market economy is its inability to easily incorporate the benefits or costs of externalities of production. For example, soil erosion is increased as a result of intensive row farming. This erosion has detrimental effects on future productivity and current and future environmental quality. This can be viewed as a cost imposed upon society as a result of agricultural production. Because farmers generally do not explicitly incorporate this cost from soil erosion in their decision-making process, they manage their farms in a way that results in levels of soil erosion that are higher than would be viewed as socially optimal.

One means of requiring farmers to incorporate the cost of soil erosion into their decision-making process is to tax soil loss. It is impossible to determine precisely the cost to society of a ton of soil loss. Because some soils are more fragile than others, and because the rate of sediment delivery differs depending on the location of a soil in a watershed, the cost of controlling a ton of soil loss differs across SMUs and their locations. Therefore, in Scenarios 6, 7, and 8, a tax of 0.50, 1.00, and 3.00 dollars, respectively, on each ton of annual soil erosion, is imposed on the models.

The effect of this tax on the optimal solutions depends on the erosiveness of the farm and the level of the tax. The more erosive the farm and the higher the tax, the greater will be the effect on erosion and net returns. For example, on the Woodbury County farm, because there is little or no erosion on this farm, even the 3.00 dollars per ton tax on soil loss has essentially no effect. However, on the Jasper County farm, the 0.50, 1.00, and 3.00 dollar taxes on soil loss result in approximately 4, 6, and 12 percent reductions in net returns with an approximately 76, 76, and 84 percent reductions in soil loss, respectively, as compared to no soil loss tax (Scenario 3). It is noted that a soil loss tax of only 0.50 dollars per ton results in a large reduction in soil erosion. The larger tax of 1.00 and 3.00 dollars reduces soil loss a little bit more, but not always to T-values.

Economics of Terracing

Terracing, as a means of controlling soil erosion, has been vigorously promoted in Iowa over the last 50 years. In fact, terracing has almost become a symbol of the soil erosion control errort. However, terracing has never been generally or widely accepted by Iowa farmers. The reasons are clear: terraces are expensive to build and maintain and inconvenient to farm around. Government programs that provide cost sharing to farmers have provided some incentive to farmers to build some terraces. But today, with installation costs of terracing running as high as 500 to 900 dollars per acre on many SMUs, terracing probably should be used as one of the last means of reducing soil erosion.

Based on the results of this study, terracing is never part of an economically optimal short-run farm plan when soil erosion is not highly taxed or constrained. This is because terracing imposes a short-run cost with no corresponding short-run private returns. In such scenarios where a constraint that soil loss cannot exceed T-values is imposed upon the farmer, terracing is sometimes used on seriously erosive soils in combination with conservation tillage. However, farm profits under these scenarios are reduced for erosive farms.

For example, in Scenario 9, soil loss is constrained to T-values and 50 percent of the installation costs of terracing is assumed by the government. The farmer must pay only 50 percent of the annualized installation and maintenance costs. As is illustrated in Appendix A, under this scenario, on only highly erosive SMUs are terraces part of an economically optimal plan to reduce soil erosion to T-values.

Effects of Beef Enterprises on Soil Erosion Control

Both on- and off-farm beef raising enterprises influence the management practices used by individual farmers both directly and indirectly. Even when a farmer does not raise beef cattle on his own farm, the cattle raised by others creates a demand for roughages and feed grains that the farmers produce. As is shown in Scenarios 4 and 5, the availability of markets for alfalfa and pasture allows farmers to use less intensive crop rotations to help control soil erosion on erosive soils. When these markets do not exist, in order to control erosion, farmers must rely more heavily on conservation tillage, supporting practices, and the removal of highly erosive SMUs from agricultural production.

In Scenarios 10 and 11, the farms are allowed to raise beef cattle. They can have a cow-calf operation and/or they can feed and finish out steer calves. Various rations of corn grain, corn silage, alfalfa hay, and pasture can be fed. Corn silage, alfalfa hay, and pasture cannot be sold, but must be utilized on the farm. In Scenario 10, soil erosion is not constrained. In Scenario 11, soil erosion is constrained to T-values.

Several interesting observations can be gleaned from the solutions of these scenarios as reported in Appendices A, B, and C. The cow-calf operations generally are not as profitable as feeder steer operations. Although the cow-calf operations are comparatively more profitable in the northeast and southeast parts of Iowa, they are rarely profitable enough to become a part of the profit-maximizing farming systems. Limited feeder steer operations of around 200-600 steers are part of the solutions of Scenarios 10 and 11 for all farms. In Scenario 10, the corn silage-soybean rotation is generally the most profitable rotation, and the silage is fed to the steers. When corn is harvested as silage, less residue is left for erosion control under conservation tillage systems.

In Scenario 11, where soil erosion is constrained, more hay, pasture, and corn grain are raised and included in the feed rations. Under this scenario, the comparative profitability of cow-calf operations rises, but rarely enough to be part of the optimal solutions.

In general, the farmer does not raise cattle to utilize roughages on the farm; the farmer raises cattle because he thinks that, at least on the average over time, he can raise his farm profits. The farmer wants to raise cattle at the lowest cost possible. Because there is an opportunity cost of using land to increase feed production for on-farm livestock, this means trying to maximize the total feed value per acre at the lowest cost. On SMUs that are suitable for growing corn, the farmer can raise more feed for cattle by growing and feeding corn silage and/or corn grain rather than hay or pasture. Therefore, on-farm cattle operations, especially feeder-steer operations, do not necessarily result in lower level of soil erosion.

Effects of Swine Enterprises on Soil Erosion Control

In Scenarios 12 and 13, it is assumed that the farmers are willing and able to have a farrow-finish hog operation of up to 120 litters per year. In Scenario 12, soil erosion is unconstrained. In Scenario 13, it is assumed that soil erosion is constrained to T-values. These scenarios were only run for farms in Boone, Grundy, Van Buren, and Ida counties. In each of these farms, the hog operation comes at the maximum allowed of 120 litters.

A hog operation requires a small amount of pasture space and will usually utilize one of the most erosive SMUs on the farm. Consequently, the hog operation reduces soil erosion slightly. However, with the exception of the small amount of pasture required, the hogs do not utilize roughages. They do not provide any economic incentives to grow more silage or hay. Therefore, under Scenario 12, the corn-soybean rotation generally remains the most profitable rotation. In Scenario 13, because of the soil erosion constraint and not because of the hog operation, more alfalfa hay and pasture are included in the rotations and sold off-farm. (A more complete analysis of the effects of on-farm livestock feeding on soil conservation practices can found in Krog, Bhide, Pope, and Heady, 1982.)

2020 Solutions

Scenarios 14, 15, and 16 maximize farm profits for the year 2020. Because crop yields and profits are partially dependent on past soil erosion, projected 2020 yields are adjusted for soil erosion for each management system based on the assumption that the system was used continuously from 1985 to 2020. This means that the 2020 yields under a highly erosive management system would be lower than under a less erosive system. In effect, the solutions of these scenarios give the management systems that would be used from 1985 to 2020 that maximize individual farm profits in the year 2020.

The results of these scenarios, in terms of optimal soil conservation practices, do not differ greatly from similar scenarios that maximize 1985 profits. The corn-soybean rotation remains generally the most profitable crop rotation; the till-plant and slot-plant tillage systems, planted on the contour for steeper SMUs, remain generally the most profitable tillage systems; and terracing is only part of the optimal solutions when soil erosion is constrained to T-values, and then only rarely. Contouring and strip cropping are more often included in the optimal solutions for 2020 than for 1985. Also, the relative profitability of soybeans is slightly less in the 2020 models.

In these scenarios, because yields are projected to increase, total production, returns, and net returns to land, labor, and management are much higher. If this occurs, it is expected that land prices will also rise accordingly.

IV. SENSITIVITY OF MODELS TO COSTS AND PRICES

The results of the models are highly dependent on the fixed level of costs and prices that are incorporated into the models. If very small changes in the costs or prices cause a large change in the optimal solutions of the models, less confidence can be given to these solutions than if larger changes in the costs or prices result in little or no changes in the solutions. To illustrate how sensitive the models used in this study are to changes in costs and prices, a range analysis is run under Scenario 3 for selected activities on farms in Boone, Van Buren, Jasper, and Ida counties. The results of this range analysis for these farms are reported in Appendix D. Of course, the sensitivity of the models depends on the erosiveness of the farm and the scenario being analyzed. The four tables in Appendix D list the selected activities, the level of the activities in the optimal solution, the input costs and prices, and a range of costs and prices where the level of the activities remain unchanged when all other costs and prices are held constant.

The solutions, in terms of optimal tillage systems, appear to be only moderately sensitive to costs. For example, a change of around 3.00 dollars per acre in the relative costs of the till-plant and slot-plant tillage system will change the optimal tillage system on many SMUs from the till-plant to the slot-plant system. The costs of the chisel-plow and the conventional fall moldboard plow tillage systems would have to be reduced by almost 8.00 and 14.00 dollars, respectively, before they would be part of the optimal solutions for Scenario 3.

In terms of optimal crop rotations, the results are generally not very sensitive. On soils that can produce good yields of corn and soybeans, the corn-soybean rotation is easily the most profitable rotation. On highly erosive and unproductive soils, pasture, and rotations with more oats and alfalfa become relatively more profitable and the solutions, therefore, become relatively more sensitive.

The solutions, in terms of supporting practices, also are not very sensitive. Contouring is used with the till-plant or slot-plant system on slopes over 5 percent. Terracing and strip cropping are not part of the optimal solutions under Scenario 3 with any reasonable assumptions of costs. However, in such scenarios where soil erosion is taxed or constrained, these supporting practices would become much more sensitive to changes in costs.

The models are not highly sensitive to most input prices. The price of herbicide, for example, could go up or down by between 20 and 40 percent without changing the optimal solutions with the exception of the Ida County farm. On that farm, a very small reduction in prices of herbicides would cause the slot-plant tillage system to replace the till-plant system on one SMU. Furthermore, as is illustrated in Appendix D, the models generally are not highly sensitive to the prices of diesel fuel, LP gas, nitrogen, phosphorous, potash, or the cost of borrowed capital.

Also in Appendix D, the models do not appear to be highly sensitive to output prices. For example, the prices of corn can range between 1.93 to 3.35, 2.52 to 2.98, 2.21 to 3.37, and 2.01 to 3.39 dollars per bushel on farms in Boone, Van Buren, Jasper, and Ida counties, respectively, before the activities in the optimal solutions under Scenario 3 would be altered. The price of soybeans can range between 6.17 to 9.05, 7.21 to 8.57, 6.66 to 16.66, and 6.28 to 18.63 dollars per bushel on the same farms without changing the activity in the optimal solutions in Scenario 3.

It can be concluded that the solutions generally are not highly sensitive to changes in the cost of a single cropping activity, or the price of a single input or output. However, if groups of prices of related inputs or outputs change significantly, the activities in the solutions might be altered.

V. POLICY IMPLICATIONS

The control of soil erosion in Iowa can come about only through a sharing of responsibilities by both farmers and the rest of society. Farmers cannot be expected to adopt soil conservation practices that endanger the economic viability of their farms. Farming's primary goal is to provide food and fiber for a growing world population. In fact, the major concern about soil erosion in Iowa is that it will compromise the future agricultural productivity of Iowa farmland. However, farmers must make a concerted effort to implement erosion control practices while maintaining productive, cost efficient farming operations. Likewise, society must be willing to encourage, promote, and help support soil and water conservation through various government policies at the local, state, and federal levels. These policies should promote and support only cost-efficient soil conservation practices. Policies that significantly reduce soil erosion but dramatically reduce the profitability of individual farms should be avoided if possible. Policies that significantly reduce soil erosion with no, or relatively small, reductions in farm productivity and profitability should be sought.

In Tables 4 through 9, the corresponding net returns to land, labor, and management, and soil erosion, under Scenarios 1 through 9, for all 18 farms are reported. In Scenario 1, it is assumed that farmers are not willing and/or able to use conservation tillage or supporting practices. In Scenario 2, they are both willing and able to use them. As can be

Table 4. Net returns to land, labor, and management, and average annual soil loss on farms 1, 2, and 3 for Scenarios 1-9[a]

Scenarios	Farm 1 (Kossuth) Net Returns	Farm 1 (Kossuth) Soil Erosion	Farm 2 (Woodbury) Net Returns	Farm 2 (Woodbury) Soil Erosion	Farm 3 (Boone) Net Returns	Farm 3 (Boone) Soil Erosion
1. (cash crop, no SWCPs)	71,521	176	60,440	0	64,382	1,082
	(94)	(171)	(89)		(94)	(218)
2. (cash grain, with SWCPs)	76,307	103	67,592	0	68,754	497
	(100)	(100)	(100)		(100)	(100)
3. (cash crop, with SWCPs)	76,307	103	67,592	0	68,754	497
	(100)	(100)	(100)		(100)	(100)
4. (cash grain, soil erosion restricted to T-values)	76,307	103	67,592	0	68,657	255
	(100)	(100)	(100)		(100)	(51)
5. (cash crop, soil erosion restricted to T-values)	76,297	56	67,592	0	68,657	255
	(100)	(54)	(100)		(100)	(51)
6. (cash crop, tax of $0.50/ ton soil loss	76,269	56	67,592	0	68,547	350
	(100)	(54)	(100)		(100)	(70)
7. (cash crop, tax of $1.00/ ton soil loss)	76,241	56	67,592	0	68,432	225
	(100)	(54)	(100)		(100)	(51)
8. (cash crop, tax of $3.00/ ton of soil loss)	76,175	17	67,592	0	68,123	105
	(100)	(17)	(100)		(99)	(21)
9. (cash crop, soil erosion restricted to T-values, 50% terrace subsidy)	76,297	56	67,592	0	68,657	255
	(100)	(54)	(100)		(100)	(51)

[a]Net returns are in dollars per farm and soil erosion is in total tons per farm. The percentage of the results in Scenario 3 is given in parentheses below each value of net returns and soil erosion.

Table 5. Net returns to land, labor, and management, and average annual soil loss on farms 4, 5, and 6 for Scenarios 1-9[a]

Scenarios	Farm 4 (Bremer) Net Returns	Farm 4 (Bremer) Soil Erosion	Farm 5 (O'Brien) Net Returns	Farm 5 (O'Brien) Soil Erosion	Farm 6 (Howard) Net Returns	Farm 6 (Howard) Soil Erosion
1. (cash crop, no SWCPs)	68,216 (93)	1,779 (170)	49,258 (92)	4,091 (170)	27,056 (92)	944 (170)
2. (cash grain, with SWCPs)	73,002 (100)	1,045 (100)	53,473 (100)	2,406 (100)	29,517 (100)	554 (100)
3. (cash crop, with SWCPs)	73,002 (100)	1,045 (100)	53,473 (100)	2,406 (100)	29,517 (100)	554 (100)
4. (cash grain, soil erosion restricted to T-values)	72,466 (99)	314 (30)	52,168 (98)	574 (24)	29,248 (99)	166 (30)
5. (cash crop, soil erosion restricted to T-values)	72,466 (99)	314 (30)	52,168 (98)	574 (24)	29,248 (99)	166 (30)
6. (cash crop, tax of $0.50/ ton soil loss)	72,479 (99)	1,046 (100)	52,168 (98)	1,604 (67)	29,240 (99)	554 (100)
7. (cash crop, tax of $1.00/ ton soil loss)	72,152 (99)	314 (30)	52,017 (97)	722 (30)	29,081 (99)	166 (30)
8. (cash crop, tax of $3.00/ ton soil loss)	71,525 (98)	314 (30)	50,573 (95)	722 (30)	28,747 (98)	166 (30)
9. (cash crop, soil erosion restricted to T-values, 50% terrace subsidy)	72,466 (99)	314 (30)	52,435 (98)	574 (24)	29,248 (99)	166 (30)

[a]Net returns are in dollars per farm and soil erosion is in total tons per farm. The percentage of the results in Scenario 3 are given in parentheses below each value of net returns and soil erosion.

Table 6. Net returns to land, labor, and management, and average annual soil loss on farms 7, 8, and 9 for Scenarios 1-9[a]

Scenarios	Farm 7 (Grundy)		Farm 8 (Henry)		Farm 9 (Van Buren)	
	Net Returns	Soil Erosion	Net Returns	Soil Erosion	Net Returns	Soil Erosion
1. (cash crop, no SWCPs)	73,289 (94)	6,711 (170)	65,426 (94)	6,503 (170)	32,756 (92)	7,978 (157)
2. (cash grain, with SWCPs)	77,571 (100)	3,948 (100)	69,535 (100)	3,825 (100)	35,543 (100)	4,134 (81)
3. (cash crop, with SWCPs)	77,571 (100)	3,948 (100)	69,535 (100)	3,825 (100)	35,587 (100)	5,084 (100)
4. (cash grain, soil erosion restricted to T-values)	71,852 (93)	900 (23)	61,463 (88)	744 (19)	22,922 (64)	467 (9)
5. (cash crop, soil erosion restricted to T-values)	74,860 (97)	890 (23)	65,129 (94)	808 (21)	32,356 (91)	419 (8)
6. (cash crop, tax of $0.50/ ton soil loss)	76,132 (98)	2,402 (61)	68,440 (98)	1,344 (35)	34,467 (97)	1,423 (28)
7. (cash crop, tax of $1.00/ ton soil loss)	75,430 (97)	1,185 (30)	67,768 (97)	1,344 (35)	33,756 (95)	1,423 (28)
8. (cash crop, tax of $3.00/ ton soil loss)	73,061 (94)	1,185 (30)	65,595 (94)	1,033 (27)	31,831 (89)	161 (3)
9. (cash crop, soil erosion restricted to T-values 50% terrace subsidy)	74,860 (97)	890 (23)	65,129 (94)	808 (21)	32,356 (91)	419 (8)

[a]Net returns are in dollars per farm and soil erosion is in total tons per farm. The percentage of the results in Scenario 3 are given in parentheses below each value of net returns and soil erosion.

Table 7. Net returns to land, labor, and management, and average annual soil loss on farms 10, 11, and 12 for Scenarios 1-9[a]

Scenarios	Farm 10 (Adair)		Farm 11 (Clarke)		Farm 12 (Allamakee)	
	Net Returns	Soil Erosion	Net Returns	Soil Erosion	Net Returns	Soil Erosion
1. (cash crop, no SWCPs)	48,732 (91)	16,926 (170)	56,012 (90)	23,492 (183)	51,986 (93)	21,982 (167)
2. (cash grain, with SWCPs)	53,472 (100)	9,957 (100)	62,030 (100)	13,819 (108)	55,639 (100)	12,564 (95)
3. (cash crop, with SWCPs)	53,472 (100)	9,957 (100)	62,030 (100)	12,819 (100)	55,765 (100)	13,187 (100)
4. (cash grain, soil erosion restricted to T-values)	32,635 (61)	455 (5)	32,797 (53)	235 (2)	29,067 (53)	757 (6)
5. (cash crop, soil erosion restricted to T-values)	47,573 (89)	1,003 (10)	54,841 (88)	783 (6)	45,791 (82)	431 (3)
6. (cash crop, tax of $0.50/ ton soil loss)	51,089 (96)	3,277 (33)	58,959 (95)	4,146 (32)	52,899 (95)	3,770 (29)
7. (cash crop, tax of $1.00/ ton soil loss)	49,516 (93)	3,066 (31)	56,886 (92)	4,146 (32)	51,289 (92)	3,117 (24)
8. (cash crop, tax of $3.00/ ton soil loss)	17,396 (33)	837 (8)	54,780 (88)	901 (7)	47,762 (86)	1,539 (12)
9. (cash crop, soil erosion restricted to T-values 50% terrace subsidy)	47,573 (89)	1,003 (10)	54,841 (88)	783 (6)	46,728 (84)	652 (5)

[a]Net returns are in dollars per farm and soil erosion is in total tons per farm. The percentage of the results in Scenario 3 are given in parentheses below each value of net returns and soil erosion.

Table 8. Net returns to land, labor, and management, and average annual soil loss on farms 13, 14, and 15 for Scenarios 1-9[a]

	Farm 13 (Jackson)		(Farm 14 (Appanoose)		Farm 15 (Iowa)	
Scenarios	Net Returns	Soil Erosion	Net Returns	Soil Erosion	Net Returns	Soil Erosion
1. (cash crop, no SWCPs)	30,571 (93)	18,302 (167)	28,440 (88)	19,506 (170)	77,525 (94)	14,575 (170)
2. (cash grain, with SWCPs)	33,097 (100)	10,711 (99)	32,476 (100)	11,475 (100)	82,759 (100)	8,574 (100)
3. (cash crop, with SWCPs)	33,124 (100)	10,806 (100)	32,476 (100)	11,475 (100)	82,759 (100)	8,574 (100)
4. (cash grain, soil erosion restricted to T-values)	14,227 (43)	418 (4)	16,277 (50)	387 (3)	59,426 (72)	1,007 (12)
5. (cash crop, soil erosion restricted to T-values)	25,045 (76)	496 (5)	23,274 (72)	456 (4)	75,126 (91)	1,360 (16)
6. (cash crop, tax of $0.50/ ton soil loss)	30,917 (93)	3,213 (30)	30,034 (92)	3,590 (31)	80,489 (97)	2,703 (32)
7. (cash crop, tax of $1.00/ ton soil loss)	29,818 (90)	2,001 (19)	23,820 (73)	2,115 (18)	79,137 (96)	2,703 (32)
8. (cash crop, tax of $3.00/ ton soil loss)	27,631 (83)	944 (9)	27,201 (84)	512 (4)	75,075 (91)	1,795 (21)
9. (cash crop, soil erosion restricted to T-values 50% terrace subsidy)	26,640 (80)	329 (3)	23,274 (72)	456 (4)	75,126 (91)	1,360 (16)

[a]Net returns are in dollars per farm and soil erosion is in total tons per farm. The percentage of the results in Scenario 3 are given in parentheses below each value of net returns and soil erosion.

Table 9. Net returns to land, labor, and management, and average annual soil loss on farms 16, 17, and 18 for Scenarios 1-9[a]

Scenarios	(Farm 16 (Pottawattamie)		Farm 17 (Jasper)		Farm 18 (Ida)	
	Net Returns	Soil Erosion	Net Returns	Soil Erosion	Net Returns	Soil Erosion
1. (cash crop, no SWCPs)	51,465 (92)	14,166 (170)	66,954 (94)	15,607 (134)	31,989 (90)	30,341 (164)
2. (cash grain, with SWCPs)	55,705 (100)	8,334 (100)	71,366 (100)	11,658 (100)	35,650 (100)	18,456 (100)
3. (cash crop, with SWCPs)	55,705 (100)	8,334 (100)	71,366 (100)	11,658 (100)	35,650 (100)	18,456 (100)
4. (cash grain, soil erosion restricted to T-values)	44,890 (81)	1,151 (14)	44,553 (62)	755 (6)	16,766 (47)	523 (3)
5. (cash crop, soil erosion restricted to T-values)	47,333 (85)	927 (11)	61,448 (86)	1,125 (10)	25,053 (70)	752 (4)
6. (cash crop, tax of $0.50/ ton soil loss)	53,665 (96)	2,838 (34)	68,832 (96)	2,830 (24)	32,760 (92)	2,890 (16)
7. (cash crop, tax of $1.00/ ton soil loss)	52,321 (94)	2,587 (31)	67,418 (94)	2,830 (24)	31,313 (88)	2,892 (16)
8. (cash crop, tax of $3.00/ ton of soil loss)	47,472 (85)	2,170 (26)	62,873 (88)	1,902 (16)	27,633 (78)	1,511 (8)
9. (cash crop, soil erosion restricted to T-values, 50% terrace subsidy)	48,269 (87)	926 (11)	62,167 (87)	1,077 (9)	25,053 (70)	752 (4)

[a]Net returns are in dollars per farm and soil erosion is in total tons per farm. The percentage of the results in Scenario 3 are given in parentheses below each value of net returns and soil erosion.

seen in Tables 4 through 9, on all 18 farms, it is more profitable to farm using the conservation tillage systems than to farm using the conventional fall moldboard plow system. In Scenario 2, the farmers generally adopt the till-plant tillage system (planted on the contour or cross-slope on slopes greater than 5 percent). As a result of the reduced costs of this system, in comparison with Scenario 1, profits are increased by about 7 percent or more and soil erosion is reduced by 40 percent on most of the farms.

This implies that strictly economic factors are not the major obstacles to at least a partial but significant reduction of soil erosion that can be obtained with the use of conservation tillage. The obstacles to the adoption of conservation tillage may be such factors as the perceived risk of reduced yields, lack of management skills or needed information, or simply an aversion to change. This also implies that the first step towards reducing soil erosion on farms throughout Iowa is to encourage and promote the use of conservation tillage, specifically the till- and slot-plant systems, by overcoming these obstacles.

Policies that help overcome the obstacle of a perceived risk of reduced yields under conservation tillage would include support of expanded research on how yields are affected by tillage. For example, experiments that look at the yield differences between tillage systems have been conducted across the Corn Belt. Recent studies show little consistent evidence that conservation tillage generally results in reduced yields Griffith, Mannering, and Moldenhauer (1977) point out that, if the growing season is sufficiently long, and corn is planted following a crop other than corn on a good structured soil that is well drained, corn yields are likely to increase under conservation tillage. Erback, Lovely, and Ayres (1980) conducted a five-year study in central Iowa on soils of the Clarion-Nicollet-Webster Soil Association comparing continuous corn yields across seven tillage systems. They concluded that "the fall moldboard plow system produced high yields more consistently than did other tillage systems. The till-plant system had average yields nearly as great as the fall moldboard plow system" (pp. 14, 15). However, Erbach (1982) conducted a similar five-year study on the same soils with corn and soybeans grown in rotation. He concluded that the "research shows that corn and soybeans can be grown in rotations, using conservation tillage systems to control soil erosion, without sacrificing yield of either crop" (p. 14).

Similar studies need to be conducted on a variety of soils throughout Iowa. Conservation tillage must be well proven before most farmers will be willing to adopt it. Also, a crop insurance plan, designed specifically for first time users of the till-plant or slot-plant tillage systems, may be a partial solution to the obstacle of perceived risk of lower yields under these systems.

The obstacles of lack of management skills or needed information to adopt conservation tillage systems can partially be solved by well-done and well-coordinated research and extension. Issues relating to optimal planting time, pest management, fertilizer management, planting in heavy residue, seed variety selection, and other management problems associated with conservation tillage are in need of further research.

Information and technical assistance must be disseminated to farmers by a well coordinated and efficient extension effort. These efforts are never easy. However, because farmers can reduce soil erosion significantly with the adoption of conservation tillage without reducing their profits, the research and extension efforts relating to the promotion and support of conservation tillage appear to be the first steps towards the control of soil erosion in Iowa.

In addition to obstacles such as the perceived risk of reduced yields under conservation tillage and lack of management skills and information, there still is an aversion to change on the part of many farmers. This may be the result of a variety of reasons such as lack of perceived need for soil erosion controls, a desire to follow the traditional methods of farming, an aesthetic appeal for black, clean-tilled seedbeds, the reluctance to have fields different than the neighbors' clean-tilled fields, or other reasons. Policy attempts to overcome these obstacles can be taken in the form of direct regulation, and economic incentives and/or penalties.

Some examples of direct regulation are the banning of preplant tillage following soybeans, banning the use of moldboard plow on slopes greater than 2 percent, mandating a one-pass till-plant or slot-plant tillage system on slopes greater than 5 percent, and so forth. Although these types of policies may not be politically feasible, they would help reduce soil erosion with a minimum of reductions in farm profits. Of course, farmers must be willing and able to adjust their management practices. If they are not, they could experience significant hardship.

Another means of legislating the use of conservation tillage, that may be more politically feasible, is through cross-compliance legislation. Only farmers that adopt certain conservation tillage practices are eligible for participation in the various commodity programs.

Economic penalties such as taxing soil erosion (see Scenarios 6-8, which assume a 0.50, 1.00, and 3.00 dollars tax on soil loss, respectively, in Appendix A, and Tables 4-9), taxing acres of moldboard plowed ground, or other methods of penalizing farmers for the use of erosive tillage systems can be a means of encouraging conservation tillage. Again, these types of policies are not well supported by farm groups for obvious reasons and may not be politically feasible.

Policies of economic incentives such as subsidies for the use of conservation tillage can also be used. For example, a per-acre subsidy can be paid to farmers for the first year that they use the till-plant or slot-plant system, or the government may share part of the cost of a till- or slot-plant planter, provided the farmer uses it only for a one-pass till- or slot-plant system. These policies may be questionable because the till-plant tillage system is already the most profitable tillage system over time when proper and skilled management is used, and the farmers should adopt it without subsidy. However, a policy of sharing some of the costs of a new till-planter would provide an additional incentive to develop the necessary management skills to change and should speed up the adoption of one-pass till-plant tillage systems.

It seems reasonable that farmers should be expected to adopt conservation tillage practices that reduce soil erosion without reducing farm profits. However, conservation tillage alone is not enough to reduce soil erosion to T-values on many highly erosive soils in Iowa. On these soils, additional reductions in soil erosion are needed, but come at a much greater cost. For example, Scenarios 4 and 5 reflect a policy of restricting soil erosion to T-values. Scenario 4 assumes that the farmer has no market to sell pasture or alfalfa hay; Scenario 5 assumes that he does. On farms 1 through 6, because they are not highly erosive farms, soil erosion can be reduced to T-values with no loss of profits compared to Scenario 1. However, as can be seen in Tables 6 through 9, more erosive farms, such as farms 7-18, must plant less intensive (and less profitable) crop rotations, strip crop, put in terraces, and sometimes leave extremely erosive land out of agricultural production in order to reduce soil erosion to T-values. This, of course, results in losses in profits for individual farms. Generally, the more erosive the farm is, the greater are the losses in profits.

Policies that share some of the costs of further reducing soil erosion on erosive farms can be implemented. Whereas, policies that promote conservation tillage are generally appropriate throughout Iowa, policies that promote the use of less intensive cropping systems, strip cropping, terracing, and the setting aside of highly erosive and relatively unproductive land for wildlife should be targeted for more erosive farms in more erosive areas of Iowa. For example, cost sharing on terrace installation should be made available only for soils where erosion cannot be adequately controlled by conservation tillage or where a less intensive cropping system would not be a more appropriate and profitable means of controlling erosion. As can be seen in Scenario 9, even when soil erosion is constrained to T-values and installation costs of terracing is subsidized by 50 percent, terracing is part of an economically optimal means of controlling soil erosion on only four soils in this study (310C2 on O'Brien County farm; 163E2 on the Allamakee and Jackson counties; 9C2 on the Pottawattamie County farm; and 24E2 on the Jasper County farm).

VI. LIMITATIONS OF THE STUDY

This study examines many aspects of the economics of soil and water conservation, but it does have some limitations. For example, this study looks at only the short-run profitability of soil conservation practices. Because these practices affect soil erosion and soil erosion has an important impact on the future productivity of the soil, management decisions by the farmers affect not only current but also future profits. The 2020 runs in Scenarios 14, 15, and 16 attempt to look at the long-term profitability issues, but even these scenarios are not highly informative. They do not incorporate reasonable assumptions about farmers' objectives. This is not possible to do using single period linear programming models. (For a dynamic analysis of the economics of soil conservation using an optimal control theory approach, see Bhide, Pope, and Heady, 1982.) Also, the 2020 scenarios are based on the assumption that relative prices and costs do not change over time. The 2020 projected yields are highly questionable, as are any attempts to project that far into the future, and adjustments of these yields for soil erosion are crude interpolations of highly limited data. Much more research dealing with the effects of a reduction in topsoil depth on yields needs to be done before accurate yield adjustment for soil loss can be made.

There are other limitations of this study. It does not look at how such factors as farm size, tenure situations, or capital constraints affect the economics of various conservation practices. (For a discussion of the effects of these factors on the economics of soil and water conservation practices, see Banks, Bhide, Pope, and Heady, 1982.)

Only the effects of soil conservation on individual farms are studied. The market effects of adopting soil and water conservation practices are not explicitly considered in this study. No account is taken of wind erosion. The soil erosion values calculated under the various management practices are, in effect, only values of soil movement. Much of this movement may take place within field or farm boundaries. Sediment delivery, off the farm or to public waterways is not specifically estimated. Also, other supporting practices such as grassed waterways, sediment control basins, and field border planting are not explicitly included. It is assumed that these practices, particularly grassed waterways, are used where needed to control gully erosion. Finally, no account of water pollution caused by soil conservation practices or soil loss is taken.

This study looks at average costs and returns of different management systems over time; it does not consider the costs of adjustment in equipment and management. Except in the scenarios where it is assumed the farmers are unwilling or unable to use conservation tillage or conservation supporting practices, high levels of management ability are assumed for all tillage systems. Also, the analysis is for representative farms only. Specific constraints of actual individual farms are not considered, nor are alternative objectives such as maximizing cash flow after-tax income explicitly considered.

Some final limitations of the study are that the LP models consider only certain points in a range of technical possibilities. For example, greater adjustments in cropping systems may be possible than suggested in the soil erosion tax scenarios, and because only one fertilizer level is used for each crop rotation, the sensitivity of fertilizer use to prices is probably greater than implied by this study. Also, the models assume that farmers make decisions based on perfect information about yields, prices, and input requirements, or that they make their decisions based on expected yields, prices, and inputs where these expectations are formulated similarly to the data used in the models. The prices used in the models are extrapolated from historical data. The yields are also extropolated from past data and assume average or normal weather effects on yields. The input requirements are based on requirements for a normal or average year. Because prices fluctuate, and because few years are normal, farmers' decisions are not based on a perfect knowledge of these factors and risk and uncertainty are a very big part of any farmer's management decisions. How this risk and uncertainty affects their management decisions is not incorporated in this study and is a needed area of further research.

VII. SUMMARY AND CONCLUSIONS

Soil erosion has become a serious problem in Iowa. Although many farmers are concerned about soil and water conservation, they must adopt conservation practices within the framework of economic constraints imposed upon them by a highly competitive profession. Economics plays a vital role in how various conservation practices are adopted. Economic conditions over the last 100 years have progressively encouraged more and more intensive and erosive use of Iowa farmland. However, conservation practices do exist that help control soil erosion. The objective of this study is to evaluate various soil and water conservation practices in an economic framework.

Linear programming (LP) models that maximize before-tax net returns to land, labor, and management have been built for 18 representative farms throughout Iowa. These models incorporate five tillage systems, three supporting practices, and 15 crop rotations on three to five soil-mapping units (SMUs). The five tillage systems included are the conventional fall moldboard plow, spring-disk, chisel-plow, till-plant, and slot-plant systems. The supporting practices included are contouring, strip-cropping, and terracing. The crop rotations include combinations of corn grain, corn silage, soybeans, oats, alfalfa, and pasture. The models examine different scenarios that incorporate various assumptions about soil loss taxes, soil loss constraints, terrace subsidies, the farmers' willingness and ability to adopt conservation practices, and other factors.

The solutions obtained from analyzing these models under these scenarios provide some interesting results. The corn-soybean rotation is generally the most profitable crop rotation throughout Iowa. Only on highly erosive and unproductive soils, it is more profitable to grow alfalfa, hay, pasture, or oats. In general, to maximize profits, the models try to maximize the number of acres in the corn-soybean rotation within the constraints imposed upon the models by the particular scenario. Also, the profitability of raising alfalfa hay and pasture depends on the availability of markets for these crops.

When the farmers are willing and able to use conservation tillage, because of the reduction in capital, fuel, and other costs, the till-plant tillage system is generally the most cost efficient tillage system, and when used, it reduces soil erosion significantly. The slot-plant tillage system is only slightly more costly but reduces soil erosion even more. In such cases where yields are not reduced, net returns may actually rise as a result of switching from the conventional fall moldboard plow system to the till-plant or slot-plant tillage system. On slopes greater than 5 percent, planting is done on the contour for the till- and slot-plant system.

Only in the scenarios where soil erosion is constrained to T-limits or heavily taxed do strip-cropping and terracing become part of an economically optimal management system. Because it is so costly, terracing is part of an economically optimal system to reduce soil erosion to T-values only on seriously erosive soils and then only in combination with conservation tillage. This is true even when 50 percent of installation costs of terracing are shared by the government.

On-farm cattle operations, that are capable of utilizing less erosive roughage crops, do not necessarily result in reduced soil erosion. Farmers generally do not feed cattle to utilize roughages; they feed them to increase farm profits. Because there is an opportunity cost of using land to grow feed for on-farm cattle, farmers want to maximize the total feed value per acre at the lowest cost. On soils that are suitable for raising corn, farmers can grow more feed at a lower cost by growing and feeding corn silage and/or corn grain rather than hay or pasture. If the farmer feeds corn silage, soil erosion may actually increase as a result of an on-farm cattle feeding operation. Likewise, on-farm swine operations do not greatly affect the optimal soil conservation practices used.

In conclusion, conservation tillage in combination with contour planting is the most economically viable means of reducing soil erosion on most Iowa soils. On extremely erosive soils, less intensive crop rotations, strip-cropping, and even some terracing may be needed. However, on most Iowa soils, conservation tillage, specifically the till-and slot-plant systems, can at least partially control soil erosion without general reductions in farm profits. Because farmers can reduce soil erosion significantly without reducing their farm profits by adopting conservation tillage, policy efforts to hasten and support the adoption of conservation tillage through research, extension, and technical assistance appears to be the first step towards soil erosion control in Iowa. Policies that promote and support the use of less intensive cropping systems, strip cropping and terracing, in combination with conservation tillage, should be targeted for highly erosive soils. Policies that set aside land for wildlife should be targeted for extremely erosive, fragile, and/or unproductive soils.

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APPENDIX A. NET RETURNS, SOIL LOSS, AND OPTIMAL ROTATION, TILLAGE SYSTEM AND SUPPORTING PRACTICES FOR EACH SMU, IN EACH FARM, UNDER EACH SCENARIO

Table A1. Summary of 16 scenarios for farm 1.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	107A1	210	41,261	196.48	0	0	CB	Conventional	none
	55A1	116	25,518	219.98	0	0	CB	Conventional	none
	138B1	24	4,742	197.58	176	7.33	CB	Conventional	none
Farm Total	----	350	71,521	204.35	176	0.50	--	---	--
2	107A1	210	44,133	210.16	0	0	CB	till plant	none
	55A1	116	27,104	233.66	0	0	CB	till plant	none
	138B1	24	5,070	211.25	103	4.31	CB	till plant	none
Farm Total	---	350	76,307	218.02	103	0.30	--	--	--
3	(Same as scenario 2)								
4	(Same as scenario 2)								
5	107A1	210	44,133	210.16	0	0	CB	till plant	none
	55A1	116	27,104	233.66	0	0	CB	till plant	none
	138B1	24	5,060	210.83	56	2.33	CB	till plant	contour
Farm Total	---	340	76,297	218.00	56	0.16	--	--	---
6	107A1	210	44,133	210.16	0	0	CB	till plant	none
	55A1	116	27,104	233.66	0	0	CB	till plant	none
	138B1	24	5,032	209.66	56	2.33	CB	till plant	contour
Farm Total	---	350	76,269	217,91	56	0.16	--	----	---
7	107A1	210	44,133	210.16	0	0	CB	till plant	none
	55A1	116	27,104	233.66	0	0	CB	till plant	none
	138B1	24	5,004	208.50	56	2.33	CB	till plant	contour
Farm Total	---	350	76,241	217.83	56	0.16	--	----	---
8	107A1	210	44,133	210.16	0	0	CB	till plant	none
	55A1	116	27,104	233.66	0	0	CB	till plant	none
	138B1	24	4,938	205.77	17	0.70	CB	slot plant	contour
Farm Total	---	350	76,175	217.64	17	0.05	--	----	---

Table A1. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
9	(Same as scenario 5)								
10	107A1	210	44,133	210.16	0	0	SB	till plant	none
	55A1	116	27,104	233.66	0	0	SB	till plant	none
	138B1	24	5,070	211.25	138	5.75	SB	till plant	none
	Cattle (Feed 433 steer calves to finish)		24,359	---	-	-	--	----	--
Farm Total	---	350	100,666	287.62	138	0.39	--	----	--
11	107A1	210	44,133	210.16	0	0	SB	till plant	none
	55A1	116	27,104	233.66	0	0	SB	till plant	none
	138B1	24	5,060	210.83	74	3.10	SB	till plant	contour
	Cattle (Feed 443 Steer calves to finish)		24,355	---	-	-	--	----	--
Farm Total	---	350	100,652	287.58	74	0.21	--	----	--
12	(This scenario was not produced for Farm 1)								
13	(This scenario was not produced for Farm 1)								
14	107A1	210	80,462	383.15	0	0	CB	conventional	none
	55A1	116	48,899	421.55	0	0	CB	conventional	none
	138B1	24	9,130	380.41	176	7.33	CB	conventional	none
Farm Total	---	350	138,491	395.69	176	0.50	--	----	--
15	107A1	210	83,334	396.83	0	0	CB	till plant	none
	55A1	116	50,486	435.22	0	0	CB	till plant	none
	138B1	24	9,525	396.87	56	2.33	CB	till plant	contour
Farm Total	---	350	143,344	409.56	56	0.16	--	----	--

Table A1. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	107A1	210	83,334	396.83	0	0	CB	till plant	none
16	55A1	116	50,486	435.22	0	0	CB	till plant	none
	138B1	24	9,525	396.87	56	2.33	CB	till plant	contour
Farm Total	---	350	143,344	409.56	56	0.16	--	----	---

Table A2. Summary of 16 scenarios for Farm 2.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	66A1	343	25,005	72.90	0	0	CB	conventional	none
1	36A1	140	29,612	211.51	0	0	CB	conventional	none
	44A1	37	5,823	157.37	0	0	CB	conventional	none
Farm Total	---	520	60,440	116.23	0	0	--	----	---
	66A1	343	29,782	86.83	0	0	CB	till plant	none
2	36A1	140	31,491	224.94	0	0	CB	till plant	none
	44A1	37	6,319	170.79	0	0	CB	till plant	none
Farm Total	---	520	67,592	129.99	0	0	--	----	---
3	(Same as scenario 2)								
4	(Same as scenario 2)								
5	(Same as scenario 2)								

Table A2. Summary of 16 scenarios for Farm 2.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
6	(Same as scenario 2)								
7	(Same as scenario 2)								
8	(Same as scenario 2)								
9	(Same as scenario 2)								
	66A1	147	12,760	86.83	0	0	S	slot plant	none
10	66A1	196	17,022	86.83	0	0	SB	till plant	none
	36A1	140	31,491	224.94	0	0	SB	till plant	none
	44B1	37	6,319	170.79	0	0	SB	till plant	none
	Cattle (Feed 600 steer calves to finish)		31,206	---	-	-	--	----	--
Farm Total	---	520	98,798	190.00	0	0	--	----	--
11	(Same as scenario 10)								
12	(This scenario was not produced for Farm 2)								
13	(This scenario was not produced for Farm 2)								

Table A2. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	66A1	343	63,112	184.00	0	0	CB	conventional	none
14	36A1	140	56,963	406.88	0	0	CB	conventional	none
	44A1	37	11,831	319.75	0	0	CB	conventional	none
Farm Total	---	520	131,906	253.67	0	0	--	----	--
	66A1	343	67,889	197.93	0	0	CB	till plant	none
15	36A1	140	58,842	420.30	0	0	CB	till plant	none
	44A1	37	12,327	333.17	0	0	CB	till plant	none
Farm Total	--	520	139,058	267.42	0	0	--	----	--
16	(Same as scenario 15)								

Table A3. Summary of 16 scenarios for Farm 3.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	107A1	144	28,293	196.48	0	0	CB	conventional	none
1	55A1	80	17,598	219.98	0	0	CB	conventional	none
	138B1	74	14,621	197.58	542	7.33	CB	conventional	none
	138C2	22	3,868	175.86	540	24.55	CB	conventional	none
Farm Total	---	320	64,382	201.19	1,082	3.38	--	----	--
	107A1	144	30,263	210.16	0	0	CB	till plant	none
2	55A1	80	18,693	233.66	0	0	CB	till plant	none
	138B1	74	15,633	211.25	319	4.31	CB	till plant	none
	138C2	22	4,166	189.35	178	8.09	CB	till plant	contour
Farm Total	---	320	68,754	214.86	497	1.55	--	----	--

Table A3. Continued.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
3	(Same as scenario 2)								
	107A1	144	30,263	210.16	0	0	CB	till plant	none
	55A1	80	18,693	233.66	0	0	CB	till plant	none
4	138B1	74	15,601	210.83	172	2.33	CB	till plant	contour
	138C2	22	4,101	186.41	53	2.43	CB	slot plant	contour
Farm Total	---	320	68,657	214.55	225	0.71	--	----	--
5	(Same as scenario 4)								
	107A1	144	30,263	210.16	0	0	CB	till plant	none
	55A1	80	18,693	233.66	0	0	CB	till plant	none
6	138B1	74	15,515	209.66	172	2.33	CB	till plant	contour
	138C2	22	4,077	185.31	178	8.09	CB	till plant	contour
Farm Total	---	320	68,547	214.21	350	1.09	--	----	--
	107A1	144	30,263	210.16	0	0	CB	till plant	none
	55A1	80	18,693	233.66	0	0	CB	till plant	none
7	138B1	74	15,429	208.50	172	2.33	CB	till plant	contour
	138C2	22	4,048	183.98	53	2.43	CB	slot plant	contour
Farm Total	---	320	68,432	213.85	225	0.71	--	----	--
	107A1	144	30,263	210.16	0	0	CB	till plant	none
8	55A1	80	18,693	233.66	0	0	CB	till plant	none
	138B1	74	15,227	205.77	52	0.70	CB	slot plant	contour
	183C2	22	3,941	179.13	53	2.43	CB	slot plant	contour
Farm Total	---	320	68,123	212.88	105	0.33	--	----	--

Table A3. Continued

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
9	(Same as scenario 4)								
10	107A1	144	30,263	210.16	0	0	SB	till plant	none
	55A1	80	18,693	233.66	0	0	SB	till plant	none
	138B1	74	15,633	211.25	425	5.75	SB	till plant	none
	138C2	22	4,166	189.35	237	10.78	SB	till plant	contour
	Cattle (Feed 400 steer calves to finish)		22,003	---	-	-	--	----	--
Farm Total	---	320	90,757	283.62	662	2.07	--	----	--
11	107A1	144	30,263	210.16	0	0	SB	till plant	none
	55A1	80	18,693	233.66	0	0	SB	till plant	none
	138B1	74	15,601	210.83	230	3.10	SB	till plant	contour
	138C2	22	4,101	186.41	53	2.52	CB	slot plant	contour
	Cattle (Feed 369 steer calves to finish)		21,446	---	-	-	--	----	--
Farm Total	---	320	89,783	280.57	283	0.88	--	----	--
12	107A1	144	30,263	210.16	0	0	CB	till plant	none
	55A1	80	18,693	233.66	0	0	CB	till plant	none
	138B1	74	15,633	211.25	319	4.31	CB	till plant	none
	138C2	14	2,681	189.35	115	8.09	CB	till plant	contour
	138C2	8	1,485	189.35	8	0.96	P	----	--
	Hogs (Farrow to finish 120 litters)		15,722	---	-	-	--	----	--
Farm Total	---	320	84,476	263.99	442	1.40	--	----	--

Table A3. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
13	107A1	144	30,263	210.16	0	0	CB	till plant	none
	55A1	80	18,693	233.66	0	0	CB	till plant	none
	138B1	74	15,601	210.83	172	2.33	CB	till plant	contour
	138C2	14	2,640	186.41	34	2.43	CB	slot plant	contour
	138C2	8	1,461	186.41	8	0.96	P	----	--
	Hogs (farrow to finish 120 litters)		15,746	---	-	-	--	----	--
Farm Total	---	320	84,403	263.76	214	0.67	--	----	--
14	107A1	144	55,174	383.15	0	0	CB	conventional	none
	55A1	80	33,724	421.55	0	0	CB	conventional	none
	138B1	74	28,150	380.41	542	7.33	CB	conventional	none
	138C2	22	7,127	323.96	540	24.55	CB	conventional	none
Farm Total	---	320	124,175	388.05	1,082	3.38	--	----	--
15	107A1	144	57,143	396.83	0	0	CB	till plant	none
	55A1	80	34,818	435.22	0	0	CB	till plant	none
	138B1	74	29,369	396.87	172	2.33	CB	till plant	contour
	138C2	22	8,197	372.60	178	8.09	CB	till plant	contour
Farm Total	---	320	129,527	404.77	350	1.09	--	----	--
16	107A1	144	57,143	396.83	0	0	CB	till plant	none
	55A1	80	34,818	435.22	0	0	CB	till plant	none
	138B1	74	29,369	396.87	172	2.33	CB	till plant	contour
	138C2	22	7,997	363.48	53	2.43	CB	slot plant	contour
Farm Total	---	320	129,327	404.15	225	0.71	--	----	--

Table A4. Summary of 16 scenarios for Farm 4.

Scenarios	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	83B1	98	20,123	205.33	1,021	10.41	CB	conventional	none
	399A1	90	19,013	211.26	0	0	CB	conventional	none
	198B1	81	14,919	184.18	758	9.35	CB	conventional	none
	84A1	81	14,161	174.83	0	0	CB	conventional	none
Farm Total	---	350	68,216	194.90	1,779	5.08	--	-----	--
2	83B1	98	21,463	219.01	600	6.13	CB	till plant	none
	399A1	90	20,244	224.93	0	0	CB	till plant	none
	198B1	81	16,026	197.85	445	5.50	CB	till plant	none
	84A1	81	15,269	188.50	0	0	CB	till plant	none
Farm Total	---	350	73,002	208.58	1,045	2.99	--	-----	--
3	(Same as scenario 2)								
4	83B1	98	21,169	216.02	180	1.84	CB	slot plant	none
	399A1	90	20,244	224.93	0	0	CB	till plant	none
	198B1	81	15,784	194.86	134	1.65	CB	slot plant	none
	84A1	81	15,269	188.50	0	0	CB	till plant	none
Farm Total	---	350	72,466	207.05	314	0.90	--	-----	--
5	(Same as scenario 4)								
6	83B1	98	21,163	215.94	600	6.13	CB	till plant	none
	399A1	90	20,244	224.93	0	0	CB	till plant	none
	198B1	81	15,803	195.10	446	5.50	CB	till plant	none
	84A1	81	15,269	188.50	0	0	CB	till plant	none
Farm Total	---	350	72,479	207.08	1,046	2.29	--	-----	--

Table A4. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
7	83B1	98	20,989	214.18	180	1.84	CB	slot plant	none
	399A1	90	20,244	224.93	0	0	CB	till plant	none
	198B1	81	15,650	193.21	134	1.65	CB	slot plant	none
	84A1	81	15,269	188.50	0	0	CB	till plant	none
Farm Total	---	350	72,152	206.15	314	0.90	--	----	--
8	83B1	98	20,629	210.50	180	1.84	CB	slot plant	none
	399A1	90	20,244	224.93	0	0	CB	till plant	none
	198B1	81	15,383	189.91	134	1.65	CB	slot plant	none
	84A1	81	15,269	188.50	0	0	CB	till plant	none
Farm Total	---	350	71,525	204.36	314	0.90	--	----	--
9	(Same as scenario 4)								
10	83B1	98	21,463	219.01	800	8.17	SB	till plant	none
	399A1	90	20,244	224.93	0	0	SB	till plant	none
	198B1	81	16,026	197.85	594	7.34	SB	till plant	none
	84A1	81	15,269	188.50	0	0	SB	till plant	none
	Cattle (429 feeder Steers)		23,460	---	-	-	--	----	--
Farm Total	---	350	96,462	275.61	1,394	3.98	--	----	--
11	83B1	76	16,418	216.02	140	1.84	CB	slot plant	none
	83B1	22	4,752	216.02	76	3.47	SBSOMM	till plant	none
	399A1	90	20,244	224.93	0	0	SB	till plant	none
	198B1	81	15,784	194.86	134	1.65	CB	slot plant	none
	84A1	81	15,269	188.50	0	0	SB	till plant	none
	Cattle (376 feeder steers)		18,654	---	-	-	--	----	--
Farm Total	---	350	91,121	260.35	350	1.00	--	----	--

Table A4. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
12	(This scenario was not produced for Farm 4)								
13	(This scenario was not produced for Farm 4)								
14	83B1	98	38,160	389.39	1,021	10.41	CB	conventional	none
	399A1	90	36,679	407.54	0	0	CB	conventional	none
	198B1	81	29,481	363.96	758	9.35	CB	conventional	none
	84A1	81	28,225	348.45	0	0	CB	conventional	none
Farm Total	---	350	132,545	378.70	1,779	5.08	--	----	--
15	83B1	98	39,914	407.29	180	1.84	CB	slot plant	none
	399A1	90	37,909	421.21	0	0	CB	till plant	none
	198B1	81	30,589	377.64	446	5.50	CB	till plant	none
	84A1	81	29,332	362.13	0	0	CB	till plant	none
Farm Total	---	350	137,744	393.55	626	1.79	--	----	--
16	83B1	98	39,914	407.29	180	1.84	CB	slot plant	none
	399A1	90	37,909	421.21	0	0	CB	till plant	none
	198B1	81	30,346	374.65	134	1.65	CB	slot plant	none
	84A1	81	29,332	362.13	0	0	CB	till plant	none
Farm Total	---	350	137,501	392.86	314	0.90	--	----	--

Table A5. Summary of 16 scenarios for Farm 5.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
1	310B1	86	13,633	158.52	953	11.08	CB	conventional	none
	310C2	48	6,569	136.86	1,947	40.57	CB	conventional	none
	77B1	109	15,214	139.58	1,191	10.92	CB	conventional	none
	91A1	77	13,842	176.76	0	0	CB	conventional	none
Farm Total	---	320	49,258	153.93	4,091	12.78	--	----	--
2	310B1	86	14,768	171.72	560	6.52	CB	till plant	none
	310C2	48	7,194	149.87	1,146	23.87	CB	till plant	contour
	77B1	109	16,653	152.78	700	1.40	CB	till plant	none
	91A1	77	14,859	192.97	0	0	CB	till plant	none
Farm Total	---	320	53,473	167.10	2,406	7.52	--	----	--
3	(Same as scenario 2)								
4	310B1	86	14,507	168.69	168	1.95	CB	slot plant	none
	310C2	48	6,480	134.99	196	4.08	CB	slot plant	terrace
	77B1	109	16,323	149.75	210	1.93	CB	slot plant	none
	91A1	77	14,859	192.97	0	0	CB	till plant	none
Farm Total	---	320	52,168	163.03	574	1.79	--	----	--
5	(Same as scenario 4)								
6	310B1	86	14,488	168.46	560	6.52	CB	till plant	none
	310C2	48	6,879	143.32	344	7.16	CB	slot plant	contour
	77B1	109	16,303	149.57	700	6.43	CB	till plant	none
	91A1	77	14,859	192.97	0	0	CB	till plant	none
Farm Total	---	320	52,528	164.15	1,604	5.01	--	----	--

Table A5. Continued

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
7	310B1	86	14,339	166.73	168	1.95	CB	slot plant	none
	310C2	48	6,708	139.74	344	7.16	CB	slot plant	contour
	77B1	109	16,112	147.82	210	1.92	CB	slot plant	none
	91A1	77	14,859	192.97	0	0	CB	till plant	none
Farm Total	---	320	52,017	162.55	722	2.26	--	----	--
8	310B1	86	14,002	162.82	168	1.95	CB	slot plant	none
	310C2	48	6,020	125.42	344	7.16	CB	slot plant	contour
	77B1	109	15,693	143.97	210	1.92	CB	slot plant	none
	91A1	77	14,859	192.97	0	0	CB	till plant	none
Farm Total	---	320	50,573	158.04	722	2.26	--	----	--
9	310B1	86	14,507	168.69	168	1.95	CB	slot plant	none
	310C2	48	6,747	140.57	196	4.08	CB	slot plant	terrace
	77B1	109	16,323	149.75	210	1.93	CB	slot plant	none
	91A1	77	14,858	192.97	0	0	CB	till plant	none
Farm Total	---	320	52,435	163.85	574	1.79	--	----	--
10	310B1	86	14,768	171.72	747	8.69	SB	till plant	none
	310C2	48	7,194	149.87	1,527	31.82	SB	till plant	contour
	77B1	109	16,653	152.78	934	8.57	SB	till plant	none
	91A1	77	14,859	192.97	0	0	SB	till plant	none
	Cattle (339 feeder steers)		19,204	---	-	-	--	----	--
Farm Total	---	320	72,678	227.12	3,208	10.03	--	----	--

Table A5. Continued

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
11	310B1	86	14,507	168.69	168	1.95	CB	slot plant	none
	310C2	29	3,971	134.99	98	3.34	SSOMM	till plant	strip crop
	310C2	19	2,508	134.99	76	4.08	CB	slot plant	terrace
	77B1	109	16,323	149.75	210	1.93	CB	slot plant	none
	91A1	77	14,859	192.97	0	0	SB	till plant	none
	Cattle (281 feeder steers)		13,316	---	-	-	--	----	--
Farm Total	---	320	65,484	204.64	552	1.73	--	----	--
12	(This scenario was not produced for Farm 5)								
13	(This scenario was not produced for Farm 5)								
14	310B1	86	26,921	313.04	953	11.08	CB	conventional	none
	310C2	48	12,013	250.27	420	8.75	CCOMM	conventional	none
	77B1	109	30,844	282.97	1,191	10.92	CB	conventional	none
	91A1	77	27,343	368.31	0	0	CB	conventional	none
Farm Total	---	320	97,121	303.50	2,564	8.01	--	----	--
15	310B1	86	28,341	329.55	168	1.95	CB	slot plant	none
	310C2	48	14,620	304.58	344	7.16	CB	slot plant	contour
	77B1	109	32,630	299.36	210	1.93	CB	slot plant	none
	91A1	77	28,360	368.31	0	0	CB	till plant	none
Farm Total	---	320	103,952	324.85	722	2.26	--	----	--

Table A5. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
16	310B1	86	28,341	329.55	168	1.95	CB	slot plant	none
	310C2	48	13,872	288.99	196	4.08	CB	slot plant	terrace
	77B1	109	32,630	299.36	210	1.93	CB	slot plant	none
	91A1	77	28,360	368.31	0	0	CB	till plant	none
Farm Total	---	320	103,203	322.51	574	1.79	--	----	--

Table A6. Summary of 16 scenarios for Farm 6.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	783B1	45	6,105	135.67	433	9.61	CB	conventional	none
	84A1	90	15,735	174.83	0	0	CB	conventional	none
	784B1	45	5,216	115.91	511	11.35	CB	conventional	none
Farm Total	---	180	27,056	150.31	944	5.24	--	----	--
2	783B1	45	6,720	149.34	254	5.65	CB	till plant	none
	84A1	90	16,965	188.50	0	0	CB	till plant	none
	784B1	45	5,832	129.59	300	6.67	CB	till plant	none
Farm Total	---	180	29,517	163.98	554	3.08	--	----	--
3	(Same as scenario 2)								
4	783B1	45	6,586	146.35	76	1.67	CB	slot plant	none
	84A1	90	16,965	188.50	0	0	CB	till plant	none
	784B1	45	5,697	126.59	90	2.00	CB	slot plant	none
Farm Total	---	180	29,248	162.49	166	0.92	--	----	--

Table A6. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
5	(Same as scenario 4)								
	783B1	45	6,593	146.51	254	5.65	CB	till plant	none
6	84A1	90	16,965	188.50	0	0	CB	till plant	none
	784B1	45	5,681	126.25	300	6.67	CB	till plant	none
Farm Total	---	180	29,240	162.44	554	3.08	--	----	--
	783B1	45	6,509	144.65	76	1.69	CB	slot plant	none
7	84A1	90	16,965	188.50	0	0	CB	till plant	none
	784B1	45	5,607	124.59	90	2.00	CB	slot plant	none
Farm Total	---	180	29,081	161.56	166	0.92	--	----	--
	783B1	45	6,357	141.26	76	1.69	CB	slot plant	none
8	84A1	90	16,965	188.50	0	0	CB	till plant	none
	784B1	45	5,426	120.59	90	2.00	CB	slot plant	none
Farm Total	---	180	28,748	159.71	166	0.92	--	----	--
9	(Same as scenario 4)								
	783B1	45	6,720	149.34	339	7.54	SB	till plant	none
10	84A1	90	16,965	188.50	0	0	SB	till plant	none
	784B1	45	5,832	129.59	401	8.90	SB	till plant	none
	Cattle (191 feeder steers)		10,800	---	-	-	--	----	--
Farm Total	---	180	40,317	223.98	740	4.11	--	----	--

Table A6. Continued

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
11	783B1	34	4,983	146.35	58	1.70	CB	slot plant	none
	783B1	11	1,603	146.35	29	2.64	SBSOMM	slot plant	none
	84A1	90	16,965	188.50	0	0	SB	till plant	none
	784B1	45	5,697	126.59	90	2.00	CB	slot plant	none
	Cattle (168 feeder steers)		8,479	---	-	-	--	----	--
Farm Total	---	180	37,727	209.59	177	0.98	--	----	--
12	(This scenario was not produced for Farm 6)								
13	(This scenario was not produced for Farm 6)								
14	783B1	45	12,405	276.66	433	9.61	CB	conventional	none
	84A1	90	31,361	348.45	0	0	CB	conventional	none
	784B1	45	11,109	246.86	511	11.35	CB	conventional	none
Farm Total	---	180	54,874	304.86	944	5.24	--	----	--
15	783B1	45	13,257	294.61	76	1.69	CB	slot plant	none
	84A1	90	32,591	362.13	0	0	CB	till plant	none
	784B1	45	11,857	263.48	300	6.67	CB	till plant	none
Farm Total	---	180	57,705	320.59	376	2.09	--	----	--
16	783B1	45	13,257	294.61	76	1.67	CB	slot plant	none
	84A1	90	32,591	362.13	0	0	CB	till plant	none
	784B1	45	11,855	263.43	90	2.00	CB	slot plant	none
Farm Total	---	180	57,703	320.57	166	0.92	--	----	--

Table A7. Summary of 16 scenarios for Farm 7.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	120B1	160	38,224	238.90	1,987	12.42	CB	conventional	none
1	120C2	80	17,086	213.57	3,755	46.94	CB	conventional	none
	377B1	80	17,979	224.74	969	12.11	CB	conventional	none
Farm Total	---	320	73,289	229.03	6,711	20.97	--	----	--
	120B1	160	40,373	252.33	1,169	7.31	CB	till plant	none
2	120C2	80	18,146	226.82	2,209	27.61	CB	till plant	contour
	377B1	80	19,053	238.16	570	7.13	CB	till plant	none
Farm Total	---	320	77,571	242.41	3,948	12.34	--	----	--
3	(Same as scenario 2)								
	120B1	160	39,893	249.33	351	2.19	CB	slot plant	none
4	120C2	80	13,146	164.33	378	4.72	CB	slot plant	terrace
	377B1	80	18,813	235.16	171	2.14	CB	slot plant	none
Farm Total	---	320	71,852	224.54	900	2.81	--	----	--
	120B1	160	39,893	249.33	351	2.19	CB	slot plant	none
5	120C2	80	16,154	201.93	368	4.60	CBCOMM	slot plant	contour
	377B1	80	18,813	235.16	171	2.14	CB	slot plant	none
Farm Total	---	320	74,860	233.94	890	2.78	--	----	--
	120B1	160	39,787	248.67	1,169	7.31	CB	till plant	none
6	120C2	80	17,577	219.71	663	8.28	CB	slot plant	contour
	377B1	80	18,768	234.60	570	7.13	CB	till plant	none
Farm Total	---	320	76,132	237.91	2,402	7.50	--	----	--

Table A7. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
7	120B1	160	39,542	247.14	351	2.19	CB	slot plant	none
	120C2	80	17,246	215.57	663	8.28	CB	slot plant	contour
	377B1	80	18,642	233.03	171	2.14	CB	slot plant	none
Farm Total	---	320	75,430	235.72	1,185	3.70	--	----	--
8	120B1	160	38,842	242.76	351	2.19	CB	slot plant	none
	120C2	80	15,921	199.01	663	8.28	CB	slot plant	contour
	377B1	80	18,300	228.75	171	2.14	CB	slot plant	none
Farm Total	---	320	73,061	228.31	1,185	3.70	--	----	--
9	(Same as scenario 5)								
10	120B1	160	40,373	252.33	1,558	9.74	SB	till plant	none
	120C2	80	18,146	226.82	2,945	36.81	SB	till plant	contour
	377B1	80	19,053	238.16	760	9.50	SB	till plant	none
	Cattle (435 feeder Steers)		23,778						
Farm Total	---	320	101,350	316.72	5,263	16.45	--	----	--
11	120B1	160	39,893	249.33	351	2.19	CB	slot plant	none
	120C2	11	1,827	164.33	31	2.76	C	slot plant	contour
	120C2	69	11,319	164.33	266	3.87	SSOMM	till plant	strip crop
	377B1	80	18,813	235.16	171	2.14	CB	slot plant	none
	Cattle (368 feeder steers)		15,843	---	-	-	--	----	--
Farm Total	---	320	87,695	274.05	819	2.56	--	----	--

Table A7. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
12	120B1	160	40,373	252.33	1,169	7.31	CB	till plant	none
	120C2	73	16,587	226.82	2,019	27.61	CB	till plant	contour
	120C2	7	1,558	226.82	13	1.84	P	----	--
	377B1	80	19,053	238.16	570	7.13	CB	till plant	none
	Hogs (Farrow to finish 120 litters)		15,661	---	--	--	--	----	--
Farm Total	---	320	93,232	291.35	3,771	11.78	--	----	--
13	120B1	160	39,893	249.33	351	2.19	CB	slot plant	none
	120C2	73	12,017	164.33	336	4.60	CBCOMM	slot plant	contour
	120C2	7	1,129	164.33	13	1.86	P	----	--
	377B1	80	18,813	235.16	171	2.14	CB	slot plant	none
	Hogs (farrow to finish 120 litters)		18,910	--	--	--	--	----	--
Farm Total	---	320	90,762	283.63	872	2.72	--	----	--
14	120B1	160	70,863	442.89	1,987	12.42	CB	conventional	none
	120C2	80	31,198	389.98	3,755	46.94	CB	conventional	none
	377B1	80	33,625	420.31	969	12.12	CB	conventional	none
Farm Total	---	320	135,685	424.02	6,711	20.97	--	----	--

Table A7. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
15	120B1	160	73,698	460.61	351	2.19	CB	slot plant	none
	120C2	80	34,550	431.88	663	8.28	CB	slot plant	contour
	377B1	80	35,021	437.77	171	2.14	CB	slot plant	none
Farm Total	---	320	143,270	447.72	1,185	3.70	--	----	--
16	120B1	160	73,698	460.61	351	2.19	CB	slot plant	none
	120C2	80	30,973	387.16	221	2.76	C	slot plant	contour
	377B1	80	35,021	437.77	171	2.14	CB	slot plant	none
Farm Total	---	320	139,692	436.54	743	2.32	--	----	--

Table A8. Summary of 16 scenarios for Farm 8.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	280B1	140	31,463	224.74	1,399	9.99	CB	conventional	none
	80C2	47	7,954	169.23	2,116	45.01	CB	conventional	none
	279A1	47	10,005	212.87	0	0	CB	conventional	none
	281C1	76	16,004	210.57	2,988	39.32	CB	conventional	none
Farm Total	---	310	65,426	211.05	6,503	20.98	--	----	--

Table A8. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
2	280B1	140	33,342	238.16	823	5.88	CB	till plant	none
	80C2	47	8,565	182.24	1,244	26.48	CB	till plant	contour
	279A1	47	10,636	226.29	0	0	CB	till plant	none
	281C1	76	16,992	223.58	1,758	23.13	CB	till plant	contour
Farm Total	---	310	69,535	224.31	3,825	12.34	--	----	--
3	(Same as scenario 2)								
4	280B1	140	33,284	237.75	444	3.17	CB	till plant	contour
	80C1	47	5,664	120.51	124	2.65	C	slot plant	contour
	279A1	47	10,636	226.29	0	0	CB	till plant	contour
	281C1	76	11,879	156.31	176	2.31	C	slot plant	contour
Farm Total	---	310	61,463	198.27	744	2.40	--	----	--
5	280B1	140	33,285	237.75	444	3.17	CB	till plant	contour
	80C2	47	6,861	145.97	71	1.50	COMMM	slot plant	contour
	279A1	47	10,636	226.29	0	0	CB	till plant	none
	281C1	76	14,348	188.79	293	3.85	CBCOMM	slot plant	contour
Farm Total	---	310	65,129	210.09	808	2.61	--	----	--
6	280B1	140	33,062	236.16	444	3.17	CB	till plant	contour
	80C2	47	8,239	175.30	373	7.94	CB	slot plant	contour
	279A1	47	10,636	226.29	0	0	CB	till plant	none
	281C1	76	16,503	217.14	527	6.94	CB	slot plant	contour
Farm Total	---	310	68,440	220.77	1,344	4.34	--	----	--

Table A8. Continued.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
7	280B1	140	32,840	234.57	444	3.17	CB	till plant	contour
	80C2	47	8,053	171.33	373	7.94	CB	slot plant	contour
	279A1	47	10,636	226.29	0	0	CB	till plant	none
	281C1	76	16,239	213.67	527	6.94	CB	slot plant	contour
Farm Total	---	310	67,768	218.61	1,344	4.34	--	----	--
8	280B1	140	32,469	231.92	133	0.95	CB	slot plant	contour
	80C2	47	7,306	155.44	373	7.94	CB	slot plant	contour
	279A1	47	10,636	226.29	0	0	CB	till plant	none
	281C1	76	15,185	199.80	527	6.94	CB	slot plant	contour
Farm Total	---	310	65,595	211.60	1,033	3.34	--	----	--
9	(Same as scenario 5)								
10	280B1	140	33,342	238.16	1,097	7.84	SB	till plant	none
	80C2	47	8,565	182.24	1,659	35.30	SB	till plant	none
	279A1	47	10,636	226.29	0	0	SB	till plant	none
	281C1	76	16,992	223.58	2,344	30.84	SB	till plant	contour
	Cattle (feed 339 steer calves to finish)		21,846	---	-	-	--	----	--
Farm Total	---	310	91,382	294.78	5,100	16.45	--	----	--

Table A8. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
11	280B1	140	33,285	237.75	474	3.39	SB	slot plant	contour
	80C2	22	2,668	120.51	359	2.65	C	slot plant	contour
	80C2	25	2,996	120.51	92	3.71	SBSOMM	till plant	strip crop
	279A1	47	10,636	226.29	0	0	SB	till plant	none
	281C2	76	11,880	156.31	176	2.31	C	slot plant	terrace
	Cattle (feed 447 steer calves to finish)		22,714	---	-	-	--	----	--
Farm Total	---	310	84,178	271.55	801	2.58	--	----	--
12	(This scenario was not produced for Farm 8)								
13	(This scenario was not produced for Farm 8)								
14	280B1	140	60,038	428.85	1,399	9.99	CB	conventional	none
	80C2	47	14,295	304.15	2,116	45.01	CB	conventional	none
	279A1	47	19,273	410.06	0	0	CB	conventional	none
	281C1	76	27,518	362.08	2,988	39.32	CB	conventional	none
Farm Total	---	310	121,124	390.72	6,503	20.98	--	----	--
15	280B1	140	61,918	442.27	823	5.88	CB	till plant	none
	80C2	47	16,742	356.22	373	7.94	CB	slot plant	contour
	279A1	47	19,903	423.48	0	0	CB	till plant	none
	281C1	76	31,158	409.98	2,461	32.38	CB	fall chisel	none
Farm Total	---	310	129,722	418.46	3,657	11.80	--	----	--

Table A8. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
16	280B1	140	61,860	441.85	444	3.17	CB	till plant	contour
	80C2	47	14,610	310.85	124	2.65	C	slot plant	contour
	279A1	47	19,903	423.68	0	0	CB	till plant	none
	281C1	76	28,156	370.48	176	2.31	C	slot plant	contour
Farm Total	---	310	124,529	401.71	744	2.40	--	----	--

Table A9. Summary of 16 scenarios for Farm 9.

Scenarios	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	65E2	144	45	0.31	950	6.60	P	-	-
	131B1	108	18,673	172.90	1,290	11.94	CB	conventional	none
	132C2	108	14,039	129.99	5,738	53.13	CB	conventional	none
Farm Total	---	360	32,756	90.99	7,978	22.16	--	----	--
2	65E2	144	0	0	--	--	--	----	--
	131B1	108	20,099	186.10	759	7.03	CB	till plant	none
	132C2	108	15,444	143.00	3,375	31.25	CB	till plant	contour
Farm Total	---	360	35,543	98.73	4,134	11.48	--	----	--
3	65E2	144	44	0.31	950	6.60	P	----	--
	131B1	108	20,099	186.10	759	7.03	CB	till plant	none
	132C2	108	15,444	143.00	3,375	31.25	CB	till plant	contour
Farm Total	---	360	35,587	98.85	5,084	14.12	--	----	--

Table A9. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
13	65E2	144	0	0	--	--	--	----	--
	131B1	96	17,598	183.06	203	2.11	CB	slot plant	none
	131B1	12	2,173	183.06	35	2.91	CCB	till plant	contour
	132C2	98	2,855	29.17	153	1.56	CCOMM	till plant	strip crop
	132C2	10	295	29.17	21	2.08	P	----	--
	Hogs (farrow to finish 120 litters)		24,485	--	--	--	--	----	--
Farm Total	---	360	47,406	131.68	412	1.14	--	----	--
14	65E2	144	3,266	22.68	2,375	16.49	COMMM	conventional	none
	131B1	108	35,476	328.48	1,290	11.94	CB	conventional	none
	132C2	108	26.137	242.01	1,238	11.46	CCOMM	conventional	none
Farm Total	---	360	64,879	180.22	4,903	13.62	--	----	--
15	65E2	144	3,468	24.09	807	5.61	COMMM	slot plant	contour
	131B1	108	38,125	353.01	123	1.14	CB	slot plant	contour
	132B2	108	32,583	301.70	1,013	9.38	CB	slot plant	contour
Farm Total	---	360	74,176	206.05	1,943	5.40	--	----	--
16	65E2	144	0	0	--	--	--	----	--
	131B1	108	38,125	353.00	123	1.14	CB	slot plant	contour
	132C2	108	25,155	233.00	169	1.56	CCOMM	till plant	strip crop
Farm Total	---	360	63,280	176.00	292	1.35	--	----	--

Table A10. Summary of 16 scenarios for Farm 10.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	370B1	56	11,551	206.27	552	9.86	CB	conventional	none
	370C2	84	15,503	184.56	3,206	38.17	CB	conventional	none
	93D2	161	13,355	82.95	12,653	78.59	CB	conventional	none
	11B1	49	8,323	169.86	515	10.50	CB	conventional	none
Farm Total	---	350	48,732	139.23	16,926	48.36	--	----	--
2	370B1	56	12,317	219.95	325	5.80	CB	till plant	none
	370C2	84	16,636	198.05	1,886	22.45	CB	till plant	contour
	93D2	161	15,526	96.44	7,443	46.23	CB	till plant	contour
	11B1	49	8,993	183.54	303	6.18	CB	till plant	none
Farm Total	---	350	53,472	152.78	9,957	28.45	--	----	--
3	(Same as scenario 2)								
4	370B1	56	12,293	219.52	175	3.13	CB	till plant	contour
	370C2	84	11,495	136.84	189	2.25	C	slot plant	contour
	93D2	161	0	0	--	--	none	----	--
	11B1	49	8,847	180.54	91	1.85	CB	slot plant	none
Farm Total	---	350	32,635	93.24	455	1.30	--	----	--
5	370B1	56	12,293	219.52	176	3.13	CB	till plant	contour
	370C2	84	13,892	165.38	317	3.74	CBCOMM	slot plant	contour
	93D2	161	12,541	77.90	422	2.62	COMMM	slot plant	contour
	11B1	49	8,847	180.50	91	1.85	CB	slot plant	none
Farm Total	---	350	47,573	135.92	1,003	2.86	--	----	--

Table A10. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
6	370B1	56	12,206	217.96	175	3.13	CB	till plant	contour
	370C2	84	16,106	191.73	566	6.74	CB	slot plant	contour
	93D2	161	13,935	86.55	2,233	13.87	CB	slot plant	contour
	11B1	49	8,842	180.45	303	6.18	CB	till plant	none
Farm Total	---	350	51,089	145.97	3,277	9.36	--	----	--
7	370B1	56	12,118	216.39	176	3.13	CB	till plant	contour
	370C2	84	15,823	188.37	566	6.74	CB	slot plant	contour
	93D2	161	12,819	79.62	2,233	13.87	CB	slot plant	contour
	11B1	49	8,756	178.69	91	1.85	CB	slot plant	none
FArm Total	---	350	49,516	135.76	3,066	8.76	--	----	--
8	370B1	56	11,969	213.74	53	0.94	CB	slot plant	contour
	370C2	84	14,691	174.89	566	6.74	CB	slot plant	contour
	93D2	161	12,162	75.54	127	0.79	COMMM	slot plant	strip crop
	11B1	49	8,574	174.98	91	1.85	CB	slot plant	none
Farm Total	---	350	17,396	135.42	837	2.39	--	----	--
9	(Same as scenario 5)								
10	370B1	56	12,317	219.95	433	7.74	SB	till plant	none
	370C2	84	16,636	198.05	2,515	29.94	SB	till plant	contour
	93D2	161	15,527	96.44	10,916	67.80	SB	till plant	contour
	11B1	49	8,993	183.54	404	8.24	SB	till plant	none
	Cattle (485 feeder steers)		23,192	---	--	--	--	----	--
Farm Total	---	350	76,665	219.04	14,268	40.77	--	----	--

Table A10. Continued.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
11	370B1	56	12,293	219.52	187	3.34	SB	slot plant	contour
	370C2	84	11,495	136.84	189	2.25	C	slot plant	contour
	93D2	161	0	0	496	3.08	CCOMM	till plant	strip crop
	11B1	49	8,846	180.54	91	1.85	CB	slot plant	none
	Cattle (369 feeder steer and 7 cow-calf units)		23,016	--	--	--	--	----	--
Farm Total	---	350	55,650	159.00	963	2.75	--	----	--
12	(This scenario was not produced for Farm 10)								
13	(This scenario was not produced for Farm 10)								
14	370B1	56	21,972	392.36	552	9.86	CB	conventional	none
	370C2	84	28,397	338.06	3,206	38.17	CB	conventional	none
	93D2	161	26,274	163.20	1,241	7.70	COMMM	conventional	none
	11B1	49	16,662	340.04	515	10.50	CB	conventional	none
Farm Total	---	350	93,305	266.59	5,514	15.75	--	----	--
15	370B1	56	22,972	410.21	175	3.13	CB	till plant	contour
	370C2	84	31,975	380.66	566	6.74	CB	slot plant	contour
	93D2	161	34,018	211.29	2,233	13.87	CB	slot plant	contour
	11B1	49	17,332	353.72	303	6.18	CB	till plant	--
Farm Total	---	350	106,297	303.71	3,277	9.36	--	----	--

Table A10. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
16	370B1	56	22,972	410.21	175	3.13	CB	till plant	contour
	370C2	84	28,433	338.49	189	2.25	C	slot plant	contour
	93D2	161	27,054	168.04	496	3.08	CCOMM	till plant	strip crop
	11B1	49	17,185	350.72	91	1.85	CB	slot plant	contour
Farm Total	---	350	95,644	273.27	951	2.72	--	----	--

Table A11. Summary of 16 scenarios for Farm 11.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	93D2	248	20,572	82.95	19,491	78.59	CB	conventional	none
	362A1	112	20,657	184.44	0	0	CB	conventional	none
	364C2	90	14,783	164.25	4,001	44.46	CB	conventional	none
Farm Total	---	450	56,012	124.47	23,492	52.20	--	----	--
2	93D2	248	23,916	96.44	11,465	46.23	CB	till plant	contour
	362A1	112	22,161	197.86	0	0	CB	till plant	none
	364C2	90	15,953	177.26	2,354	26.15	CB	till plant	contour
Farm Total	---	450	62,030	137.84	13,819	30.17	--	----	--
3	(Same as scenario 2)								

Table All. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	93D2	248	0	0	-	-	--	----	--
4	362A1	112	22,161	197.86	0	0	CB	till plant	none
	364C2	90	10,636	118.18	235	2.62	C	slot plant	contour
Farm Total	---	450	32,797	72.88	235	0.52	-	----	--
	93D2	248	19,636	79.18	650	2.62	COMMM	slot plant	contour
5	362A1	112	22,161	197.86	0	0	CB	till plant	none
	364C2	90	13,044	144.93	133	1.48	COMMM	slot plant	contour
Farm Total	---	450	54,841	121.87	783	1.74	--	----	--
	93D2	248	21,465	86.55	3,440	13.87	CB	slot plant	contour
6	362A1	112	22,161	197.86	0	0	CB	till plant	none
	364C2	90	15,333	170.36	706	7.85	CB	slot plant	contour
Farm Total	---	450	58,959	131.02	4,146	9.21	--	----	--
	93D2	248	19,745	79.62	3,440	13.87	CB	slot plant	contour
7	362A1	112	22,161	197.86	0	0	CB	till plant	none
	364C2	90	14,980	166.44	706	7.85	CB	slot plant	contour
Farm Total	---	450	56,886	126.41	4,146	9.21	--	----	--
	93D2	248	19,052	76.82	195	0.79	COMMM	slot plant	strip crop
8	362A1	112	22,161	197.86	0	0	CB	till plant	none
	364C2	90	13,568	150.75	706	7.85	CB	slot plant	contour
Farm Total	---	450	54,780	121.73	901	2.00	--	----	--
9	(Same as scenario 5)								

Table A11. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
10	93D2	184	17,768	96.44	12,491	67.80	S	till plant	contour
	93D2	64	6,149	96.44	4,127	64.72	SSB	till plant	contour
	362A1	112	22,161	197.86	0	0	SB	till plant	none
	364C2	90	15,953	177.26	3,138	34.87	SB	till plant	contour
	Cattle (600 feeder steers)		29,200	--	-	--	--	----	--
Farm Total	---	450	91,231	202.74	19,756	43.90	--	----	--
11	93D2	248	0	0	764	3.08	CCOMM	till plant	strip crop
	362A1	112	22,161	197.86	0	0	SB	till plant	none
	364C2	90	10,636	118.18	235	2.62	C	slot plant	contour
	Cattle (456 feeder steers)		29,870	--	-	-	--	----	--
Farm Total	---	450	62,667	139.26	999	2.22	--	----	--
12	(This scenario was not produced for Farm 11)								
13	(This scenario was not produced for Farm 11)								
14	93D2	248	40,967	165.19	1,911	7.71	COMMM	conventional	none
	362A1	112	40,692	363.32	0	0	CB	conventional	none
	364C2	90	26,230	291.44	4,001	44.46	CB	conventional	none
Farm Total	---	450	107,888	239.75	5,912	13.14	--	----	--

Table A11. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	93D2	248	52,400	211.29	3,440	13.87	CB	slot plant	contour
15	362A1	112	42,195	376.74	0	0	CB	till plant	none
	364C2	90	31,690	352.11	706	7.85	CB	slot plant	contour
Farm Total	---	450	126,287	280.64	4,146	9.21	--	----	--
	93D2	248	42,167	170.03	764	3.08	CCOMM	till plant	strip crop
16	362A1	112	42,195	376.74	0	0	CB	till plant	none
	364C2	90	27,599	306.66	235	2.62	C	slot plant	contour
Farm Total	---	450	111,963	248.81	999	2.22	--	----	--

Table A12. Summary of 16 scenarios for Farm 12.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	163C1	40	7,666	191.64	1,832	45.80	CB	conventional	none
	163D2	100	15,691	156.91	9,478	94.78	CB	conventional	none
1	163E2	28	3,236	115.57	4,560	162.86	CB	conventional	none
	478G1	112	125	1.12	623	5.57	P	----	--
	162C1	120	25,268	210.57	5,489	45.74	CB	conventional	none
Farm Total	---	400	51,986	129.97	21,982	54.96	--	----	--

Table A12. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	163C1	40	8,186	204.65	1,078	26.94	CB	till plant	contour
	163D2	100	17,016	170.16	5,575	55.75	CB	till plant	contour
2	163E2	28	3,607	128.82	2,682	95.80	CB	till plant	contour
	478G1	112	0	0	--	-	--	----	--
	162C1	120	26,830	223.58	3,229	26.91	CB	till plant	contour
Farm Total	---	400	55,639	139.10	12,564	31.41	--	----	--
	163C1	40	8,186	204.65	1,078	26.94	CB	till plant	contour
	163D2	100	17,016	170.16	5,575	55.75	CB	till plant	contour
3	163E2	28	3,607	128.82	2,682	95.80	CB	till plant	contour
	478G1	112	126	1.12	623	5.57	P	----	--
	162C1	120	26,830	223.58	3,229	26.91	CB	till plant	contour
Farm Total	---	400	55,765	139.41	13,187	32.97	--	----	--
	163C1	40	5,663	141.57	108	2.69	C	slot plant	contour
	163D2	100	4,647	46.47	326	3.26	C	slot plant	terrace
4	163E2	28	0	0	--	-	--	----	--
	478G1	112	0	0	--	-	--	----	--
	162C1	120	18,757	156.31	323	2.69	C	slot plant	contour
Farm Total	---	400	29,067	72.67	757	1.89	--	----	--
	163C1	40	7,049	176.24	61	1.53	COMMM	slot plant	contour
	163D2	100	14,693	146.93	95	0.95	COMMM	slot plant	strip crop
5	163E2	28	1,145	40.89	92	3.29	COMMM	slot plant	terracing
	478G1	112	0	0	-	-	--	----	--
	162C2	120	22,904	190.87	183	1.52	COMMM	slot plant	contour
Farm Total	---	400	45,791	114.48	431	1.50	--	----	--

Table A12. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	163C1	40	7,905	197.63	323	8.08	CB	slot plant	contour
	163D2	100	15,883	158.83	1,673	16.73	CB	slot plant	contour
6	163E2	28	3,122	111.49	805	28.74	CB	slot plant	contour
	478G1	112	0	0	--	-	--	----	--
	162C1	120	25,989	216.58	969	8.07	CB	slot plant	contour
Farm Total	---	400	52,899	132.25	3,770	9.42	--	----	--
	163C1	40	7,744	193.59	323	8.08	CB	slot plant	contour
	163D2	100	15,047	150.47	1,673	16.73	CB	slot plant	contour
7	163E2	28	2,993	106.89	152	5.43	COMMM	slot plant	contour
	478G1	112	0	0	--	--	--	----	--
	162C1	120	25,505	212.54	969	8.07	CB	slot plant	contour
Farm Total	---	400	51,289	128.22	3,117	7.79	--	----	--
	163C1	40	7,097	177.43	323	8.08	CB	slot plant	contour
	163D2	100	14,409	144.09	95	0.95	COMMM	slot plant	strip crop
8	163E2	28	2,689	96.04	152	5.43	COMMM	slot plant	contour
	478G1	112	0	0	--	--	--	----	--
	162C1	120	23,567	196.39	969	8.07	CB	slot plant	contour
Farm Total	---	400	47,762	119.41	1,539	3.85	--	----	--
	163C1	40	7,049	176.24	61	1.53	COMMM	slot plant	contour
	163D2	100	14,693	146.93	316	3.16	COMMM	slot plant	contour
9	163E2	28	2,082	74.35	92	3.29	COMMM	slot plant	terrace
	478G1	112	0	0	--	--	--	----	--
	162C1	120	22,904	190.87	183	1.52	COMMM	slot plant	contour
Farm Total	---	400	46,728	116.82	652	1.63	--	----	--

Table A12. Continued.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
	163C1	40	8,186	204.65	1,437	35.92	SB	till plant	contour
	163D2	100	17,016	170.16	7,434	74.34	SB	till plant	contour
10	163E2	28	3,607	128.82	3,576	127.73	SB	till plant	contour
	478G1	112	0	0	--	--	--	----	--
	162C1	120	14,830	223.58	4,305	35.88	SB	till plant	contour
	Cattle (300 feeder steers)		19,102	--	--	--	--	----	--
Farm Total	---	400	74,741	139.10	16,752	41.88	--	----	--
	163C1	40	5,663	141.57	108	2.69	C	slot plant	contour
	163D2	26	1,210	46.47	97	3.72	CCOMM	till plant	strip crop
11	163D2	74	3,437	46.47	220	2.97	SSOMM	slot plant	strip crop
	163E2	28	0	0	92	3.29	COMMM	slot plant	terrace
	478G1	112	0	0	--	--	--	----	--
	162C1	120	18,757	156.31	323	2.69	C	slot plant	contour
	Cattle 409 feeder steers)		21,239	--	--	--	--	----	--
Farm Total	---	400	50,306	125.77	840	2.10	--	----	--
12	(This scenario was not produced for Farm 12)								
13	(This scenario was not produced for Farm 12)								

Table A12. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
14	163C1	40	13,283	332.07	1,832	45.80	CB	conventional	none
	163D2	100	28,514	285.14	9,478	94.78	CB	conventional	none
	163E2	28	5,994	214.08	4,560	162.86	CB	conventional	none
	478G1	112	580	5.18	623	5.55	P	----	--
	162C1	120	43,976	366.47	5,489	45.74	CB	conventional	none
Farm Total	---	400	92,347	230.87	21,982	54.96	--	----	--
15	163C1	40	15,384	384.60	1,257	31.43	CB	spring disk	none
	163D2	100	30,158	301.58	924	9.24	CBCOMM	slot plant	contour
	163E2	28	6,742	240.78	268	9.58	C	slot plant	contour
	478G1	112	580	5.18	623	5.57	P	----	--
	162C1	120	49,774	414.78	3,767	31.39	CB	spring disk	none
Farm Total	---	400	102,638	256.60	6,839	17.11	--	----	--
16	163C1	40	13,771	344.28	108	2.69	C	slot plant	contour
	163D2	100	28,379	283.79	372	3.72	CCOMM	till plant	strip crop
	163E2	28	4,204	150.15	92	3.29	COMMM	slot plant	terrace
	478G1	112	0	0	--	--	--	----	--
	162C1	120	44,480	370.67	323	2.69	C	slot plant	contour
Farm Total	---	400	90,834	227.09	895	2.24	--	----	--

Table A13. Summary of 16 scenarios for Farm 13.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	163C2	59	10,861	184.09	2,702	45.80	CB	conventional	none
	163D2	67	10,513	156.91	6,350	94.78	CB	conventional	none
1	163E2	52	6,010	115.57	8,469	162.86	CB	conventional	none
	478G1	17	28	1.62	95	5.57	P	----	--
	162C1	15	3,159	210.57	686	45.74	CB	conventional	none
Farm Total	---	210	30,571	145.57	18,302	87.15	--	----	--
	163C2	59	11,643	197.34	1,590	26.94	CB	till plant	contour
	163D2	67	11,401	170.16	3,735	55.75	CB	till plant	contour
2	163E2	52	6,699	128.82	4,982	95.80	CB	till plant	contour
	478G1	17	0	0	--	--	--	----	--
	162C1	15	3,354	223.58	404	26.91	CB	till plant	contour
Farm Total	---	210	33,097	157.60	10,711	51.00	--	----	--
	163C2	59	11,643	197.34	1,590	26.94	CB	till plant	contour
	163D2	67	11,401	170.16	3,735	55.75	CB	till plant	contour
3	163E2	52	6,699	128.82	4,982	95.80	CB	till plant	contour
	478G1	17	27	1.62	95	5.57	P	----	--
	162C1	15	3,354	223.58	404	26.91	CB	till plant	contour
Farm Total	---	210	33,124	157.73	10,806	51.45	--	----	--
	163C2	59	7,971	135.10	159	2.69	C	slot plant	contour
	163D2	67	3,911	58.37	219	3.26	C	slot plant	contour
4	163E2	52	0	0	--	--	--	----	--
	478G1	17	0	0	--	--	--	----	--
	162C1	15	2,345	156.31	40	2.69	C	slot plant	contour
Farm Total	---	210	14,227	67.75	418	1.99	--	----	--

Table A13. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	163C2	59	9,902	167.83	90	1.53	COMMM	slot plant	contour
	163D2	67	9,844	146.93	212	3.16	COMMM	slot plant	contour
5	163E2	52	2,436	46.85	171	3.29	COMMM	slot plant	terracing
	478G1	17	0	0	--	--	--	----	--
	162C1	15	2,863	190.87	23	1.52	COMMM	slot plant	contour
Farm Total	---	210	25,045	119.26	496	2.57	--	----	--
	163C2	59	11,229	190.33	477	8.08	CB	slot plant	contour
	163D2	67	10,642	158.83	1,121	16.73	CB	slot plant	contour
6	163E2	52	5,797	111.49	1,494	28.74	CB	slot plant	contour
	478G1	17	0	0	--	--	--	----	--
	162C1	15	3,249	216.58	121	8.07	CB	slot plant	contour
Farm Total	---	210	30,917	147.22	3,213	16.65	--	----	--
	163C2	59	10,991	186.29	477	8.08	CB	slot plant	contour
	163D2	67	10,081	150.47	1,121	16.73	CB	slot plant	contour
7	163E2	52	5,558	106.89	282	5.43	COMMM	slot plant	contour
	478G1	17	0	0	--	--	--	----	--
	162C1	15	3,188	212.54	121	8.07	CB	slot plant	contour
Farm Total	---	210	29,818	141.99	2,001	10.37	--	----	--
	163C2	59	10,037	170.12	477	8.08	CB	slot plant	contour
	163D2	67	9,654	144.09	64	0.95	COMMM	slot plant	strip crop
8	163E2	52	4,994	96.04	282	5.43	COMMM	slot plant	contour
	478G1	17	0	0	--	--	--	----	--
	162C1	15	2,946	196.39	121	8.07	CB	slot plant	contour
Farm Total	---	210	27,631	131.57	944	4.89	--	----	--

Table A13. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	163C2	59	9,902	167.83	90	1.53	COMMM	slot plant	contour
	163D2	67	9,844	146.93	63	0.95	COMMM	slot plant	strip crop
9	163E2	52	4,031	77.52	170	3.29	COMMM	slot plant	terrace
	478G1	17	0	0	--	--	--	----	--
	162C1	15	2,863	190.87	4	0.30	COMMM	slot plant	strip crop
Farm Total	---	210	26,640	126.86	329	1.57	--	----	--
	163C2	59	11,643	197.34	2,120	35.92	SB	till plant	contour
	163D2	67	11,401	170.16	4,981	74.34	SB	till plant	contour
10	163E2	52	6,699	128.82	6,642	127.73	SB	till plant	contour
	478G1	17	0	0	--	--	--	----	--
	162C1	15	3,354	223.58	538	35.88	SB	till plant	contour
	Cattle (212 feeder steers)		12,087	---	--	--	--	----	--
Farm Total	---	210	45,184	215.16	14,281	68.00	--	----	--
	163C2	59	7,971	135.10	159	2.69	C	slot plant	contour
	163D2	67	3,911	58.37	249	3.72	CCOMM	till plant	strip crop
11	163E2	52	0	0	171	3.29	COMMM	slot plant	terrace
	478G1	17	0	0	--	--	--	----	--
	162C1	15	2,345	156.31	40	2.69	C	slot plant	contour
	Cattle (236 feeder steers)		11,265	--	--	--	--	----	--
Farm Total	---	210	25,492	121.39	619	2.95	--	----	--

Table A13. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
12	(This scenario was not produced for Farm 13)								
13	(This scenario was not produced for Farm 13)								
14	163C2	59	19,660	333.22	2,702	45.80	CB	conventional	none
	163D2	67	19,104	285.14	6,350	94.78	CB	conventional	none
	163E2	52	11,132	214.08	8,469	162.86	CB	conventional	none
	478G1	17	97	5.68	95	5.57	P	----	--
	162C1	15	5,497	366.47	686	45.74	CB	conventional	none
Farm Total	---	210	55,490	264.24	18,302	87.15	--	----	--
15	163C2	59	22,496	381.28	477	8.08	CB	slot plant	contour
	163D2	67	20,206	301.58	623	9.29	CBCOMM	slot plant	contour
	163E2	52	12,521	240.78	498	9.58	C	slot plant	contour
	478G1	17	97	5.68	95	5.57	P	----	--
	162C1	15	6,210	414.00	471	31.39	CB	spring disk	none
Farm Total	---	210	61,530	293.00	2,164	10.30	--	----	--
16	163C2	59	19,895	337.21	159	2.69	C	slot plant	contour
	163D2	67	19,014	283.79	249	3.72	CCOMM	till plant	strip crop
	163E2	52	8,117	156.10	171	3.29	COMMM	slot plant	terrace
	478G1	17	0	0	--	--	--	----	--
	162C1	15	5,561	370.72	40	2.69	C	slot plant	contour
Farm Total	---	210	52,587	250.42	619	2.95	--	----	--

Table A14. Summary of 16 scenarios for Farm 14.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	93D2	60	4,977	82.95	4,715	78.59	CB	conventional	none
	24E2	75	5,603	74.71	10,300	137.34	CB	conventional	none
	192C2	75	5,486	73.14	3,449	45.99	CB	conventional	none
	312B1	90	12,374	137.49	1,029	11.58	CB	conventional	none
Farm Total	---	300	28,440	94.80	19,506	65.03	--	----	--
2	93D2	60	5,786	96.44	2,774	46.23	CB	till plant	contour
	24E2	75	6,615	88.20	6,059	80.79	CB	till plant	contour
	192C2	75	6,513	86.84	2,029	27.05	CB	till plant	contour
	312B1	90	13,562	150.69	613	6.81	CB	till plant	none
Farm Total	---	300	32,476	108.25	11,475	38.25	--	----	--
3	(Same as scenario 2)								
4	93D2	60	0	0	--	--	--	----	--
	24E2	75	0	0	--	--	--	----	--
	192C2	75	2,988	39.84	203	2.71	C	slot plant	contour
	312B1	90	13,289	147.65	184	2.04	CB	slot plant	none
Farm Total	---	300	16,277	54.26	387	1.29	--	----	--
5	93D2	60	4,751	79.18	157	2.62	COMMM	slot plant	contour
	24E2	75	0	0	--	--	--	----	--
	192C2	75	5,234	69.79	115	1.28	COMMM	slot plant	contour
	312B1	90	13,289	147.65	184	2.04	CB	slot plant	none
Farm Total	---	300	23,274	77.58	456	2.03	--	----	--

Table A14. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
6	93D2	60	5,193	86.55	832	13.87	CB	slot plant	contour
	24E2	75	5,485	73.13	1,818	24.24	CB	slot plant	contour
	192C2	75	5,996	79.95	609	8.12	CB	slot plant	contour
	312B1	90	13,360	148.44	331	3.68	CB	till plant	contour
Farm Total	---	300	30,034	100.11	3,590	11.97	--	----	--
7	93D2	60	4,777	79.62	832	13.87	CB	slot plant	contour
	24E2	75	5,157	68.76	343	4.58	COMMM	slot plant	contour
	192C2	75	5,692	75.89	609	8.12	CB	slot plant	contour
	312B1	90	13,194	146.60	331	3.68	CB	till plant	contour
Farm Total	---	300	28,820	96.07	2,115	7.05	--	----	--
8	93D2	60	4,609	76.82	47	0.79	COMMM	slot plant	strip crop
	24E2	75	4,470	59.60	343	4.58	COMMM	slot plant	contour
	192C2	74	5,166	68.87	23	0.31	COMMM	slot plant	strip crop
	312B1	90	12,956	143.96	99	1.10	CB	slot plant	contour
Farm Total	---	300	27,201	90.67	512	1.71	--	----	--
9	(Same as scenario 5)								
10	93D2	60	5,786	96.44	4,068	67.80	S	till plant	contour
	24E2	75	6,615	88.20	8,887	118.49	S	till plant	contour
	192C2	75	6,513	86.84	3,111	41.48	S	spring disk	none
	312B1	90	13,562	150.69	818	9.08	SB	till plant	none
	Cattle (416 feeder steers)		19,075	--	--	--	--	----	--
Farm Total	---	300	51,551	108.25	16,884	56.28	--	----	--

Table A14. Continued.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
11	93D2	39	3,088	79.18	120	3.08	CCOMM	till plant	strip crop
	93D2	21	1,663	79.18	64	3.08	P	----	--
	24E2	75	0	0	--	--	--	----	--
	192C2	75	2,988	39.84	203	2.71	C	slot plant	contour
	312B1	49	7,202	147.65	138	2.82	SSSOM	till plant	contour
	312B1	41	6,086	147.65	84	2.04	CB	slot plant	none
	Cattle (174 feeder steers and 29 beef cows)		3,148	--	--	--	--	----	--
Farm Total	---	300	24,175	80.58	609	2.03	--	----	--
12	(This scenario was not produced for Farm 14)								
13	(This scenario was not produced for Farm 14)								
14	93D2	60	9,911	165.19	462	7.71	COMMM	conventional	none
	24E2	75	12,570	167.60	1,010	13.46	COMMM	conventional	none
	192C2	75	12,634	168.45	744	9.92	CCOMM	conventional	none
	312B1	90	24,438	271.42	1,042	11.58	CB	conventional	none
Farm Total	---	300	59,543	198.48	3,258	10.86	--	----	--
15	93D2	60	12,677	211.29	823	13.87	CB	slot plant	contour
	24E2	75	13,563	180.84	1,010	13.46	CBCOMM	slot plant	contour
	192C2	75	16,108	214.77	609	8.12	CB	slot plant	contour
	312B1	90	26,619	295.77	99	1.10	CB	slot plant	contour
Farm Total	---	300	68,967	229.89	2,550	8.50	--	----	--

Table A14. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
16	93D2	60	10,202	170.03	185	3.08	CCOMM	till plant	strip crop
	24E2	75	0	0	--	--	--	----	--
	192C2	75	12,705	169.40	203	2.71	C	slot plant	contour
	312B1	90	26,619	295.77	99	1.10	CB	slot plant	contour
Farm Total	---	300	49,526	165.09	487	1.62	--	----	--

Table A15. Summary of 16 scenarios for Farm 15.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	281C2	187	37,965	203.02	7,303	39.06	CB	conventional	none
	76C2	55	10,099	183.62	2,125	38.63	CB	conventional	none
	76D2	55	8,604	156.44	4,218	76.69	CB	conventional	none
	280B1	93	20,857	224.27	929	9.99	CB	conventional	none
Farm Total	---	390	77,525	198.78	14,575	37.37	--	----	--
2	281C2	187	40,443	216.27	4,296	22.97	CB	till plant	contour
	76C2	55	10,841	197.11	1,250	22.72	CB	till plant	contour
	76D2	55	9,346	169.93	2,481	45.11	CB	till plant	contour
	280B1	93	22,129	237.94	547	5.88	CB	till plant	none
Farm Total	---	390	82,759	212.20	8,574	21.98	--	----	--
3	(Same as scenario 2)								

Table A15. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
4	281C2	187	28,021	149.85	430	2.30	C	slot plant	contour
	76C2	55	7,423	134.96	125	2.27	C	slot plant	contour
	76D2	55	1,893	34.41	157	2.85	C	slot plant	terrace
	280B1	93	22,089	237.52	295	3.17	CB	till plant	contour
Farm Total	---	390	59,426	152.37	1,007	2.58	--	----	--
5	281C2	187	35,427	189.45	716	3.83	CBCOMM	slot plant	contour
	76C2	55	9,531	173.29	208	3.79	CBCOMM	slot plant	contour
	76D2	55	8,079	146.89	141	2.56	COMMM	slot plant	contour
	280B1	93	22,089	237.52	295	3.17	CB	till plant	contour
Farm Total	---	390	75,126	192.63	1,360	3.49	--	----	--
6	281C2	187	39,244	209.86	1,289	6.89	CB	slot plant	contour
	76C2	55	10,491	190.75	375	6.82	CB	slot plant	contour
	76D2	55	8,812	160.22	744	13.53	CB	slot plant	contour
	280B1	93	21,942	235.93	295	3.17	CB	till plant	contour
Farm Total	---	390	80,489	206.38	2,703	6.93	--	----	--
7	281C2	187	38,599	206.41	1,289	6.89	CB	slot plant	contour
	76C2	55	10,304	187.34	375	6.82	CB	slot plant	contour
	76D2	55	8,440	153.45	744	13.53	CB	slot plant	contour
	280B1	93	21,794	234.35	295	3.17	CB	till plant	contour
Farm Total	---	390	79,137	202.92	2,703	6.93	--	----	--

Table A15. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
8	281C2	187	36,021	192.63	1,289	6.89	CB	slot plant	contour
	76C2	55	9,554	173.71	375	6.82	CB	slot plant	contour
	76D2	55	7,952	144.59	42	0.77	COMMM	slot plant	strip crop
	280B1	93	21,548	231.70	89	0.95	CB	slot plant	contour
Farm Total	---	390	75,075	192.50	1,795	4.60	--	----	--
9	(Same as scenario 5)								
10	281C1	187	40,443	216.27	5,728	30.63	SB	till plant	contour
	76C2	55	10,841	197.11	1,666	30.30	SB	till plant	contour
	76D2	55	9,346	169.93	3,308	60.15	SB	till plant	contour
	280B1	93	22,129	237.94	729	7.84	SB	till plant	none
	Cattle (485 feeder steers)		26,830	--	--	--	--	----	--
Farm Total	---	390	109,589	281.00	11,431	29.31	--	----	--
11	281C2	187	28,021	149.85	430	2.30	C	slot plant	contour
	76C2	55	7,423	134.96	125	2.27	C	slot plant	contour
	76D2	34	1,175	34.41	103	3.01	CCOMM	till plant	strip crop
	76D2	21	718	34.41	50	2.41	SOMMM	slot plant	strip crop
	280B1	28	6,731	237.52	96	3.39	SB	slot plant	contour
	280B1	65	15,358	237.52	253	3.91	SSB	slot plant	contour
	Cattle (614 feeder steers)		17,289	--	--	--	--	----	--
Farm Total	---	390	92,415	236.96	1,057	2.71	--	----	--

Table A15. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
12	(This scenario was not produced for Farm 15)								
13	(This scenario was not produced for Farm 15)								
14	281C2	187	68,756	367.68	7,303	39.06	CB	conventional	none
	76C2	55	18,542	337.12	2,125	38.63	CB	conventional	none
	76D2	55	15,897	289.03	4,218	76.69	CB	conventional	none
	280B1	93	39,839	428.38	929	9.99	CB	conventional	none
Farm Total	---	390	143,034	366.75	14,575	37.37	--	----	--
15	281C2	187	76,728	410.31	1,289	6.89	CB	slot plant	contour
	76C2	55	20,886	379.75	375	6.82	CB	slot plant	contour
	76D2	55	19,012	345.67	744	13.53	CB	slot plant	contour
	280B1	93	41,111	442.05	547	5.88	CB	till plant	none
Farm Total	---	390	157,737	404.45	2,955	7.58	--	----	--
16	281C2	187	67,917	363.19	430	2.30	C	slot plant	contour
	76C2	55	18,514	336.62	125	2.27	C	slot plant	contour
	76D2	55	15,555	282.82	165	3.01	CCOMM	till plant	strip crop
	280B1	93	41,072	441.63	295	3.17	CB	till plant	contour
Farm Total	---	390	143,058	366.81	1,015	2.60	--	----	--

Table A16. Summary of 16 scenarios for Farm 16.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	9B1	61	11,702	191.83	613	10.05	CB	conventional	none
	9C2	61	10,352	169.71	2,321	38.06	CB	conventional	none
	9D2	118	16,955	143.69	8,940	146.55	CB	conventional	none
	11B1	58	9,903	170.74	609	10.50	CB	conventional	none
	24D2	22	2,553	116.05	1,683	76.50	CB	conventional	none
Farm Total	---	320	51,465	160.83	14,166	44.27	--	----	--
2	9B1	61	12,507	205.03	361	5.91	CB	till plant	none
	9C2	61	11,160	182.96	1,366	22.39	CB	till plant	contour
	9D2	118	18,519	156.94	5,259	44.56	CB	till plant	contour
	11B1	58	10,669	183.94	358	6.18	CB	till plant	none
	24D2	22	2,850	129.54	990	45.00	CB	till plant	contour
Farm Total	---	320	55,705	174.08	8,334	26.04	--	----	--
3	(Same as scenario 2)								
4	9B1	61	12,482	204.63	195	3.24	CB	till plant	contour
	9C2	61	8,982	147.25	270	4.42	CB	slot plant	terrace
	9D2	118	11,940	101.40	526	4.46	C	slot plant	contour
	11B1	58	10,493	180.91	107	1.85	CB	slot plant	none
	24D2	22	993	45.15	52	2.46	C	slot plant	terrace
Farm Total	---	320	44,890	140.28	1,151	3.60	--	----	--

Table A16. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	9B1	61	12,482	204.63	195	3.19	CB	till plant	contour
	9C2	61	8,982	147.25	270	4.42	CB	slot plant	terrace
5	9D2	118	13,332	112.98	299	2.53	COMMM	slot plant	contour
	11B1	58	10,493	180.91	107	1.85	CB	slot plant	none
	24D2	22	2,044	92.90	56	2.55	COMMM	slot plant	contour
Farm Total	---	320	47,333	147.92	927	2.90	--	----	--
	9B1	61	12,385	203.03	195	3.19	CB	till plant	contour
	9C1	61	10,774	176.63	410	6.72	CB	slot plant	contour
6	9D2	118	17,380	147.29	1,578	13.37	CB	slot plant	contour
	11B1	58	10,490	180.85	358	6.18	CB	till plant	none
	24D2	22	2,636	119.84	297	13.50	CB	slot plant	contour
Farm Total	---	320	53,665	167.70	2,838	8.87	--	----	--
	9B1	61	12,288	201.44	195	3.19	CB	till plant	contour
	9C2	61	10,570	173.27	410	6.72	CB	slot plant	contour
7	9D2	118	16,591	140.60	1,578	13.37	CB	slot plant	contour
	11B1	58	10,385	179.06	107	1.85	CB	slot plant	none
	24D2	22	2,488	113.09	297	13.50	CB	slot plant	contour
Farm Total	---	320	52,321	163.50	2,587	7.81	--	----	--
	9B1	61	12,123	198.75	58	0.96	CB	slot plant	contour
	9C2	61	9,750	159.84	410	6.72	CB	slot plant	contour
8	9D2	118	13,436	113.86	1,578	13.37	CB	slot plant	contour
	11B1	58	10,170	175.35	107	1.85	CB	slot plant	none
	24D2	22	1,993	90.60	17	0.76	COMMM	slot plant	strip crop
Farm Total	---	320	47,472	148.35	2,170	6.78	--	----	--

Table A16. Continued.

Scenario	SMU Code	Net Acres	Net Returns		Tons Soil Loss		Rotation	Tillage System	Supporting Practice
			Per SMU	Per Acre	Per SMU	Per Acre			
9	9B1	61	12,482	204.63	195	3.19	CB	till plant	contour
	9C2	61	8,824	162.59	270	4.42	CB	slot plant	terrace
	9D2	118	13,332	112.98	298	2.53	COMMM	slot plant	contour
	11B1	58	10,493	180.91	107	1.85	CB	slot plant	none
	24D2	22	2,044	92.90	56	2.55	COMMM	slot plant	contour
Farm Total	---	320	48,269	150.84	926	2.89	--	----	--
10	9B1	61	12,507	205.03	481	7.88	SB	till plant	none
	9C2	61	11,160	182.96	1,821	29.85	SB	till plant	contour
	9D2	118	18,519	156.94	7,012	59.42	SB	till plant	contour
	11B1	58	10,669	183.94	478	8.24	SB	till plant	none
	24D2	22	2,850	129.54	1,452	66.00	S	till plant	contour
	Cattle (370 feeder steers)		20,008	--	--	--	--	----	--
Farm Total	---	320	75,713	174.08	11,243	35.13	--	----	--
11	9B1	49	9,984	204.63	208	4.26	SB	till plant	contour
	9B1	12	2,498	204.63	55	4.47	SSB	till plant	contour
	9C2	43	6,302	147.25	96	2.24	C	slot plant	contour
	9C2	18	2,680	147.25	57	3.13	SSOMM	till plant	strip crop
	9D2	118	13,332	112.98	526	4.46	C	slot plant	contour
	11B1	58	10,493	180.91	107	1.85	CB	slot plant	none
	24D2	22	2,044	92.90	53	2.40	SOMMM	slot plant	strip crop
	Cattle (395 feeder steers)		15,763	--	--	--	--	----	--
Farm Total	---	320	63,096	147.92	1,102	3.44	--	----	--

Table A16. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
12	(This scenario was not produced for Farm 16)								
13	(This scenario was not produced for Farm 16)								
	9B1	61	22,591	370.34	613	10.05	CB	conventional	none
	9C2	61	19,386	317.80	2,321	38.06	CB	conventional	none
14	9D2	118	31,563	267.48	8,940	75.76	CB	conventional	none
	11B1	58	19,773	340.92	609	10.50	CB	conventional	none
	24D2	22	4,720	214.55	1,683	76.50	CB	conventional	none
Farm Total	---	320	98,033	306.35	14,166	44.27	--	----	--
	9B1	61	23,566	386.32	195	3.19	CB	till plant	contour
	9C2	61	21,720	356.07	410	6.72	CB	slot plant	contour
15	9D2	118	37,795	320.30	1,578	13.37	CB	slot plant	contour
	11B1	58	20,539	354.12	358	6.18	CB	till plant	none
	24D2	22	5,817	264.42	297	13.50	CB	slot plant	contour
Farm Total	---	320	109,438	341.99	2,838	8.87	--	----	--
	9B1	61	23,566	386.32	195	3.19	CB	till plant	contour
	9C2	61	19,597	321.27	270	4.42	CB	slot plant	terrace
16	9D2	118	32,639	276.60	526	4.46	C	slot plant	contour
	11B1	58	20,363	351.09	107	1.85	CB	slot plant	none
	24D2	22	4,393	199.68	66	3.00	CCOMM	till plant	strip crop
Farm Total	---	320	100,558	314.24	1,164	3.64	--	----	--

Table A17. Summary of 16 scenarios for Farm 17.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	120C2	204	43,569	213.57	9,575	46.94	CB	conventional	none
	162D2	68	11,958	175.85	5,574	81.97	CB	conventional	none
	119A1	34	8,820	259.41	0	0	CB	conventional	none
	24E2	34	2,607	76.69	458	13.46	COMMM	conventional	none
Farm Total	---	340	66,954	196.92	15,607	45.90	--	----	--
2	120C2	204	46,271	226.82	5,632	27.61	CB	till plant	contour
	162D2	68	12,859	189.10	3,279	48.22	CB	till plant	contour
	119A1	34	9,269	272.61	0	0	CB	till plant	none
	24E2	34	2,967	87.26	2,747	80.79	CB	till plant	contour
Farm Total	---	340	71,366	209.90	11,658	34.29	--	----	--
3	(Same as scenario 2)								
4	120C2	204	33,146	162.48	563	2.76	C	Slot plant	contour
	162D2	68	2,138	31.44	192	2.82	C	slot plant	terrace
	119A1	34	9,269	272.61	0	0	CB	till plant	none
	24E2	34	0	0	--	--	--	----	--
Farm Total	---	340	44,553	131.04	755	2.22	--	----	--
5	120C2	204	41,193	201.93	939	4.60	CBCOMM	slot plant	contour
	162D2	68	10,986	161.56	186	2.73	COMMM	slot plant	contour
	119A1	34	9,269	272.61	0	0	CB	till plant	contour
	24E2	34	0	0	--	--	--	----	--
Farm Total	---	340	61,448	180.73	1,125	3.31	--	----	--

Table A17. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
6	120C2	204	44,821	219.71	1,690	8.28	CB	slot plant	contour
	162D2	68	12,165	178.90	984	14.46	CB	slot plant	contour
	119A1	34	9,269	272.61	0	0	CB	till plant	none
	24E2	34	2,577	75.81	156	4.58	COMMM	slot plant	contour
Farm Total	---	340	68,832	202.45	2,830	8.32	--	----	--
7	120C2	204	43,976	215.57	1,690	8.28	CB	slot plant	contour
	162D2	68	11,673	171.67	984	14.46	CB	slot plant	contour
	119A1	34	9,269	272.61	0	0	CB	till plant	none
	24E2	34	2,500	73.52	156	4.58	COMMM	slot plant	contour
Farm Total	---	340	67,418	198.29	2,830	8.32	--	----	--
8	120C2	204	40,597	199.01	1,690	8.28	CB	slot plant	contour
	162D2	68	10,819	159.10	56	0.82	COMMM	slot plant	strip crop
	119A1	34	9,269	272.61	0	0	CB	till plant	none
	24E2	34	2,188	64.36	156	4.58	COMMM	slot plant	contour
Farm Total	---	340	62,873	184.92	1,902	5.59	--	----	--
9	120C2	204	41,193	201.93	939	4.60	CBCOMM	slot plant	contour
	162D2	68	10,986	161.56	56	0.82	COMMM	slot plant	strip crop
	119A1	34	9,269	272.61	0	0	CB	till plant	none
	24E2	34	719	21.14	82	2.40	COMMM	slot plant	terrace
Farm Total	---	340	62,167	182.84	1,077	3.16	--	----	--

Table A17. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
10	120C2	204	46,271	226.82	7,510	36.81	SB	till plant	contour
	162D2	68	12,859	189.10	4,372	64.29	SB	till plant	contour
	119A1	34	9,269	272.61	0	0	SB	till plant	none
	24E2	34	2,967	87.26	4,029	118.49	S	till plant	contour
	Cattle (447 feeder steers)		23,671	--	--	--	--	----	--
Farm Total	---	340	95,037	279.52	15,911	46.79	--	----	--
11	120C2	204	33,146	162.48	563	2.76	C	slot plant	contour
	162D2	20	642	31.44	66	3.21	CCOMM	till plant	strip crop
	162D2	48	1,496	31.44	122	2.57	SOMMM	slot plant	strip crop
	119A1	34	9,269	272.61	0	0	S	till plant	none
	24E2	34	0	0	--	--	--	----	--
	Cattle (535 feeder steers)		28,486	--	--	--	--	----	--
Farm Total	---	340	73,039	214.82	751	2.21	--	----	--
12	(This scenario was not produced for Farm 17)								
13	(This scenario was not produced for Farm 17)								
14	120C2	204	79,555	389.98	9,575	46.94	CB	conventional	none
	162D2	68	21,730	319.55	5,574	81.97	CB	conventional	none
	119A1	34	16,471	484.45	0	0	CB	conventional	none
	24E2	34	5,970	175.59	458	13.46	COMMM	conventional	none
Farm Total	---	340	123,726	363.90	15,607	45.90	--	----	--

Table A17. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
15	120C2	204	88,103	431.88	1,690	8.28	CB	slot plant	contour
	162D2	68	25,709	378.07	984	14.46	CB	slot plant	contour
	119A1	34	16,920	497.65	0	0	CB	till plant	none
	24E2	34	6,364	187.17	458	13.46	CBCOMM	slot plant	contour
Farm Total	---	340	137,096	403.22	3,132	9.21	--	----	--
16	120C2	204	78,981	387.16	563	2.76	C	slot plant	contour
	162D2	68	20,889	307.20	219	3.21	CCOMM	till plant	strip crop
	119A1	34	16,920	497.65	0	0	CB	till plant	none
	24E2	34	2,038	59.93	82	2.40	COMMM	slot plant	terrace
Farm Total	---	340	11,828	349.49	864	2.54	--	----	--

Table A18. Summary of 16 scenarios for Farm 18.

Scenarios	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acres	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
1	1D3	47	3,907	83.14	4,257	90.57	CB	conventional	none
	1E3	93	3,995	42.95	17,202	184.97	CB	conventional	none
	10C2	56	8,083	144.33	2,162	38.61	CB	conventional	none
	10D2	52	5,356	102.99	4,039	77.68	CB	conventional	none
	12C1	62	10,648	171.74	2,681	43.25	CB	conventional	none
Farm Total	---	310	31,989	103.19	30,341	97.88	--	----	--

Table A18. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
2 & 3	1D3	47	4,509	95.93	2,504	53.28	CB	till plant	contour
	1E3	93	5,185	55.75	10,119	108.81	CB	till plant	contour
	10C2	56	8,641	154.30	1,484	26.49	CB	spring disk	none
	10D2	52	5,874	112.96	2,772	53.31	CB	spring disk	none
	12C1	62	11,441	184.54	1,577	25.44	CB	till plant	contour
Farm Total	---	310	35,650	115.00	18,456	59.54	--	----	--
4	1D3	47	0	0	0	0	--	----	--
	1E3	93	0	0	0	0	--	----	--
	10C2	56	5,678	101.39	127	2.27	C	slot plant	contour
	10D2	52	3,410	65.59	238	4.57	C	slot plant	contour
	12C1	62	7,678	123.83	158	2.54	C	slot plant	contour
Farm Total	---	310	16,766	54.08	523	1.69	--	----	--
5	1D3	47	3,520	74.90	142	3.01	COMMM	slot plant	contour
	1E3	93	0	0	0	0	--	----	--
	10C2	56	7,313	130.60	212	3.78	CBCOMM	slot plant	contour
	10D2	52	4,680	90.00	135	2.59	COMMM	slot plant	contour
	12C1	62	9,539	153.86	263	4.24	CBCOMM	slot plant	contour
Farm Total	---	310	25,053	80.82	752	2.42	--	----	--

Table A18. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
	1D3	47	3,992	84.93	751	15.98	CB	slot plant	contour
	1E3	93	3,786	40.71	573	6.17	COMMM	slot plant	contour
6	10C2	56	8,448	150.86	381	6.81	CB	slot plant	contour
	10D2	52	5,516	106.07	712	13.71	CB	slot plant	contour
	12C1	62	11,018	177.71	473	7.63	CB	slot plant	contour
Farm Total	---	310	32,760	105.68	2,890	9.33	--	----	--
	1D3	47	3,616	76.94	751	15.98	CB	slot plant	contour
	1E3	93	3,500	37.63	573	6.17	COMMM	slot plant	contour
7	10C2	56	8,257	147.45	382	6.81	CB	slot plant	contour
	10D2	52	5,159	99.22	713	13.71	CB	slot plant	contour
	12C1	62	10,782	173.90	473	7.63	CB	slot plant	contour
Farm Total	---	310	31,313	101.01	2,892	9.33	--	----	--
	1D3	47	3,393	72.18	43	0.91	COMMM	slot plant	strip crop
	1E3	93	2,353	25.30	573	6.17	COMMM	slot plant	contour
8	10C2	56	7,494	133.82	382	6.81	CB	slot plant	contour
	10D2	52	4,559	87.67	40	0.78	COMMM	slot plant	strip crop
	12C1	62	9,835	158.63	473	7.63	CB	slot plant	contour
Farm Total	---	310	27,633	89.14	1,511	4.87	--	----	--
9	(Same as scenario 5)								

Table A18. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
10	1D3	47	4,509	95.93	3,673	78.14	S	till plant	contour
	1E3	93	5,185	55.75	14,841	159.58	S	till plant	contour
	10C2	56	8,641	154.30	1,696	30.28	SB	till plant	contour
	10D2	52	5,874	112.96	3,168	60.92	SB	till plant	contour
	12C1	62	11,441	184.54	2,103	33.92	SB	till plant	contour
	Cattle (372 feeder steers)		18,950	--	--	--	--	----	--
Farm Total	---	310	54,600	115.00	25,481	82.20	--	----	--
11	1D3	47	0	0	134	2.84	SOMMM	slot plant	strip crop
	1E3	93	0	0	0	0	--	----	--
	10C2	23	2,378	101.39	53	2.27	C	slot plant	contour
	10C2	33	3,300	101.39	104	3.18	SSOMM	till plant	strip crop
	10D2	52	3,410	65.59	238	4.57	C	slot plant	contour
	12C1	62	7,678	123.83	158	2.54	C	slot plant	contour
	Cattle (262 feeder steers)		13,468	---	--	--	--	----	--
Farm Total	---	310	30,234	97.53	687	2.21	--	----	--
12	1D3	47	4,509	95.93	2,504	53.28	CB	till plant	contour
	1E3	77	4,298	55.75	8,389	108.81	CB	till plant	contour
	1E3	16	886	55.75	115	7.25	P	----	--
	10C2	56	8,641	154.30	1,484	26.50	CB	spring disk	none
	10D2	52	5,874	112.96	2,772	53.31	CB	spring disk	none
	12C1	62	11,441	184.54	1,577	25.44	CB	till plant	contour
	Hogs farrow to finish 120 litters)		16,152	--	--	--	--	----	--
Farm Total	---	310	51,802	115.00	16,841	54.33	--	----	--

Table A18. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practices
	1D3	47	4,014	85.40	167	3.55	CCOMM	till plant	strip crop
	1E3	93	0	0	0	0	--	----	--
	10C2	56	8,220	146.78	212	3.78	CBCOMM	slot plant	contour
13	10D2	41	4,223	101.75	190	4.57	C	slot plant	contour
	10D2	11	1,068	101.75	32	3.05	P	----	--
	12C1	15	2,628	171.77	39	2.54	C	slot plant	contour
	12C1	47	8,022	171.77	198	4.24	CBCOMM	slot plant	contour
	Hogs (farrow to finish 120 litters)		11,422	--	--	--	--	----	--
Farm Total	---	310	39,597	127.73	838	2.70	--	----	--
	1D3	47	9,401	200.03	4,257	90.57	CB	conventional	none
	1E3	93	12,597	135.45	17,202	184.97	CB	conventional	none
14	10C2	56	15,015	268.12	2,162	38.61	CB	conventional	none
	10D2	52	10,247	197.05	4,039	77.68	CB	conventional	none
	12C1	62	21,248	342.71	2,681	43.25	CB	conventional	none
Farm Total	---	310	68,508	220.99	30,341	97.88	--	----	--
	1D3	47	10,003	212.83	2,504	53.28	CB	till plant	contour
	1E3	93	13,787	148.25	10,119	108.81	CB	till plant	contour
15	10C2	56	17,285	308.66	382	6.81	CB	slot plant	contour
	10D2	52	12,585	242.02	713	13.71	CB	slot plant	contour
	12C1	62	22,042	355.51	1,577	25.44	CB	till plant	contour
Farm Total	---	310	75,702	244.20	15,295	49.34	--	----	--

Table A18. Continued.

Scenario	SMU Code	Net Acres	Net Returns Per SMU	Net Returns Per Acre	Tons Soil Loss Per SMU	Tons Soil Loss Per Acre	Rotation	Tillage System	Supporting Practice
16	1D3	47	7,989	169.98	167	3.55	CCOMM	till plant	strip crop
	1E3	93	445	4.78	321	3.46	COMMM	slot plant	terrace
	10C2	56	15,275	272.77	127	2.27	C	slot plant	contour
	10D2	52	10,852	208.68	238	4.57	C	slot plant	contour
	12C1	62	19,438	313.52	158	2.54	C	slot plant	contour
Farm Total	---	310	53,999	174.19	1,011	3.26	--	----	--

APPENDIX B. PRODUCTION LEVELS AND REVENUE FOR EACH FARM UNDER EACH SCENARIO

Table B1. Crop production levels and revenue for Farm 1

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	26,194	26,194	0	8,603	8,603	0	0	0	0	0	0	0	0	129,857	0	129,857
(Results of Scenarios 2, 3, 4, 5, 6, 7, 8, and 9 duplicate Scenario 1)																
10	0	0	3,495	8,603	8,603	0	0	0	0	0	0	0	0	62,800	272,801	335,601
(Results of Scenario 11 duplicate Scenario 10)																
14	46,864	46,864	0	12,477	12,477	0	0	0	0	0	0	0	0	211,052	0	211,052
15	46,882	46,882	0	12,482	12,482	0	0	0	0	0	0	0	0	211,135	0	211,135
(Results of Scenario 16 duplicate Scenario 15)																

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 1.

Table B2. Crop production levels and revenue for Farm 2

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	27,772	27,772	0	9,237	9,237	0	0	0	0	0	0	0	0	138,523	0	138,523
(Results of Scenarios 2, 3, 4, 5, 6, 7, 8, and 9, duplicate Scenario 1)																
10	0	0	4,734	7,116	7,116	0	0	0	0	0	0	0	0	51,949	369,558	421,507
(Results of Scenario 11 duplicate Scenario 10)																
14	49,715	49,715	0	13,404	13,404	0	0	0	0	0	0	0	0	225,118	0	225,118
(Results of Scenarios 15 and 16 duplicate Scenario 14)																

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 2.

Table B3. Crop production levels and revenue for Farm 3

Scenario	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	23,681	23,681	0	7,788	7,788	0	0	0	0	0	0	0	0	117,479	0	117,479
(Results of Scenarios 2, 3, 4, 5, 6, 7, 8, and 9 duplicate Scenario 1)																
10	0	0	3,159	7,788	7,788	0	0	0	0	0	0	0	0	56,855	246,579	303,434
11	1,488	0	2,961	7,788	7,788	0	0	0	0	0	0	0	0	56,855	242,324	299,179
12	23,151	11,391	0	7,612	7,612	0	0	0	0	0		58	0	84,732	90,825	175,557
(Results of Scenario 13 duplicate Scenario 12)																
14	42,172	42,172	0	11,243	11,243	0	0	0	0	0	0	0	0	190,033	0	190,033
15	42,413	42,413	0	11,307	11,307	0	0	0	0	0	0	0	0	191,121	0	191,121
16	42,380	42,380	0	11,299	11,299	0	0	0	0	0	0	0	0	190,975	0	190,975

Table B4. Crop production levels and revenue for Farm 4

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	25,447	25,447	0	8,349	8,349	0	0	0	0	0	0	0	0	126,091	0	126,091
(Results of Scenarios 2, 3, 4, 5, 6, 7, 8, and 9 duplicate Scenario 1)																
10	0	0	3,385	8,349	8,349	0	0	0	0	0	0	0	0	60,947	264,280	325,227
11	11,435	0	1,791	7,988	7,988	358	358	5	0	42	0	0	0	58,874	232,084	290,959
14	45,347	45,347	0	12,061	12,061	0	0	0	0	0	0	0	0	204,135	0	204,135
15	45,517	45,517	0	12,106	12,106	0	0	0	0	0	0	0	0	204,897	0	204,897
(Results of Scenario 16 duplicate Scenario 15)																

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 4.

Table B5. Crop production levels and revenue for Farm 5

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	19,865	19,865	0	6,541	6,541	0	0	0	0	0	0	0	0	98,603	0	98,603
(Results of Scenarios 2, 3, 4, 5, 6, 7, 8, and 9 duplicate Scenario 1)																
10	0	0	2,678	6,541	6,541	0	0	0	0	0	0	0	0	47,750	209,069	256,818
11	12,911	0	882	5,975	5,975	537	537	8	0	48	0	0	0	44,456	173,041	217,497
14	34,175	34,175	0	8,057	8,057	1,395	1,395	21	21	117	117	0	0	156,308	0	156,308
15	35,595	35,595	0	9,502	9,502	0	0	0	0	0	0	0	0	160,487	0	160,487
16	35,553	35,553	0	9,490	9,490	0	0	0	0	0	0	0	0	160,296	0	160,296

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 5.

Table B6. Crop production levels and revenue for Farm 6

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	11,155	11,155	0	3,679	3,670	0	0	0	0	0	0	0	0	55,415	0	55,415
(Results of Scenarios 2, 3, 4, 5, 6, 7, 8, and 9 duplicate Scenario 1)																
10	0	0	1,504	3,679	3,679	0	0	0	0	0	0	0	0	26,859	117,412	144,271
11	4,427	0	868	3,539	3,539	139	139	2	0	16	0	0	0	26,050	103,495	129,546
14	19,783	19,783	0	5,290	5,290	0	0	0	0	0	0	0	0	89,264	0	89,264
15	19,904	19,904	0	5,322	5,322	0	0	0	0	0	0	0	0	89,807	0	89,807
16	19,936	19,936	0	5,331	5,331	0	0	0	0	0	0	0	0	89,949	0	89,949

[a]Soultions under Scenarios 12 and 13 were not obtained for Farm 6.

Table B7. Crop production levels and revenue for Farm 7

Scenario	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	25,803	25,803	0	8,465	8,465	0	0	0	0	0	0	0	0	127,850	0	127,850
-(Results of Scenarios 2, 3, and 4 duplicate Scenario 1)-																
5	23,735	23,735	0	7,125	7,125	1,347	1,347	20	20	160	160	0	0	125,123	0	125,123
-(Results of Scenarios 6, 7, and 8 duplicate Scenario 1 and Scenario 9 duplicate Scenario 5)-																
10	0	0	3,434	8,469	8,469	0	0	0	0	0	0	0	0	61,794	268,072	329,865
11	21,210	0	551	6,456	6,456	1,392	1,392	21	0	165	0	0	0	49,296	226,654	275,950
12	25,270	13,510	0	8,292	8,292	0	0	0	0	0	0	58	0	95,120	90,825	185,946
13	23,379	11,619	0	7,068	7,068	1,231	1,231	0	0	146	146	58	0	91,704	90,825	182,530
14	45,272	45,272	0	12,040	12,040	0	0	0	0	0	0	0	0	203,792	0	203,792
15	46,294	46,294	0	12,310	12,310	0	0	0	0	0	0	0	0	208,377	0	208,377
16	55,877	55,877	0	9,344	9,344	0	0	0	0	0	0	0	0	211,260	0	211,260

Table B8. Crop production levels and revenue for Farm 8

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	23,611	23,611	0	7,785	7,785	0	0	0	0	0	0	0	0	117,277	0	117,277
(Results of Scenarios 2 and 3 duplicate Scenario 1)																
4	31,312	31,312	0	4,845	4,845	0	0	0	0	0	0	0	0	115,539	0	115,539
5	19,832	19,832	0	5,483	5,483	1,624	1,624	24	24	289	289	0	0	111,203	0	111,203
(Results of Scenarios 6, 7, and 8 duplicate Scenario 1 and Scenario 9 duplicates Scenario 5)																
10	0	0	3,146	7,785	7,785	0	0	0	0	0	0	0	0	56,832	245,601	302,433
11	13,498	0	2,134	4,846	4,846	335	335	5	0	50	0	0	0	35,902	275,477	311,378
14	41,081	41,081	0	10,979	0	0	0	0	0	0	0	0	0	185,312	0	185,312
15	42,309	42,309	0	11,309	11,309	0	0	0	0	0	0	0	0	190,863	0	190,863
16	56,030	56,030	0	7,033	7,033	0	0	0	0	0	0	0	0	194,777	0	194,777

[a]Scenarios 12 and 13 were not obtained for Farm 8.

Table B9. Crop production levels and revenue for Farm 9

Scenario	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	13,354	13,354	0	4,386	4,386	0	0	0	0	0	0	373	373	69,188	0	69,188
2	13,354	13,354	0	4,386	4,386	0	0	0	0	0	0	0	0	66,207	0	66,207
(Results of Scenario 3 duplicate Scenario 1)																
4	18,665	18,665	0	2,366	2,366	0	0	0	0	0	0	0	0	65,056	0	65,056
5	9,688	9,688	0	2,366	2,366	1,243	1,243	19	19	285	285	0	0	61,381	0	61,381
(Results of Scenarios 6 and 7 duplicate Scenario 2 and Scenarios 8 and 9 duplicate Scenario 5)																
10	0	0	1,817	4,386	4,386	0	0	0	0	0	0	0	0	32,020	141,837	173,857
11	11,528	0	32	2,366	2,366	1,243	1,243	19	19	199	0	0	0	19,214	117,976	137,188
12	13,354	1,594	0	4,386	4,386	0	0	0	0	0	0	58	0	36,102	90,825	126,927
13	11,760	0	0	2,280	2,280	1,127	1,127	17	0	172	172	58	0	28,328	90,825	119,153
14	21,400	21,400	0	3,322	3,322	2,022	2,022	30	30	604	604	0	0	118,548	0	118,548
15	24,278	24,278	0	6,465	6,465	0	0	0	0	312	312	0	0	127,376	0	127,376
16	21,445	21,445	0	3,423	3,423	1,945	1,945	29	29	280	280	0	0	100,554	0	100,554

Table B10. Crop production levels and revenue for Farm 10

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	20,769	20,769	0	6,790	6,790	0	0	0	0	0	0	0	0	102,733	0	102,733
-(Results of Scenarios 2 and 3 duplicate Scenario 1)-																
4	18,461	18,461	0	2,450	2,450	0	0	0	0	0	0	0	0	65,146	0	65,146
5	14,358	14,538	0	3,094	3,094	2,311	2,311	35	35	492	492	0	0	93,056	0	93,056
-(Results of Scenarios 6 and 7 duplicate Scenario 1)-																
8	16,318	16,318	0	4,380	4,380	1,399	0	21	21	342	342	0	0	96,700	0	96,700
-(Results of Scenario 9 duplicate Scenario 5)-																
10	0	0	3,829	4,380	4,380	0	0	0	0	0	0	0	0	31,977	298,910	330,888
11	19,988	0	560	2,450	2,450	1,399	1,399	1,399	21	0	228	0	0	20,069	227,164	247,233
14	28,595	28,595	0	6,193	6,193	2,175	2,175	33	33	501	501	0	0	152,359	0	152,359
15	37,268	37,268	0	9,876	9,876	0	0	0	0	0	0	0	0	167,504	0	167,504
16	43,368	43,468	0	3,548	3,548	2,175	2,175	33	33	0	0	334	334	161,230	0	161,230

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 10.

Table B11. Crop production levels and revenue for Farm 11

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	25,093	25,093	0	8,208	8,208	0	0	0	0	0	0	0	0	124,159	0	124,159
(Results of Scenarios 2 and 3 duplicate Scenario 1)																
4	18,730	18,730	0	2,574	2,574	0	0	0	0	0	0	0	0	66,737	0	66,737
5	14,741	14,741	0	2,574	2,574	3,509	3,509	53	53	698	698	0	0	110,699	0	110,699
(Results of Scenarios 6 and 7 duplicate Scenario 1)																
8	18,237	18,237	0	4,498	4,498	2,316	2,316	35	35	526	526	0	0	115,240	0	115,240
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	4,734	5,134	5,134	0	0	0	0	0	0	0	0	37,475	369,558	407,033
11	19,734	0	1,045	2,574	2,574	2,316	2,316	35	0	351	0	0	0	22,401	280,877	303,278
14	31,800	31,800	0	6,300	6,300	3,602	3,602	54	54	772	772	0	0	180,274	0	180,274
15	45,160	45,160	0	11,976	11,976	0	0	0	0	0	0	0	0	203,037	0	203,037
16	49,509	49,509	0	3,735	3,735	3,602	3,602	54	54	515	515	0	0	192,030	0	192,030

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 11.

Table B12. Crop production levels and revenue for Farm 12

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	19,828	19,828	0	6,533	6,533	0	0	0	0	0	0	267	267	100,581	0	100,581
2	19,828	19,828	0	6,533	6,533	0	0	0	0	0	0	0	0	98,448	0	98,448
(Results of Scenario 3 duplicate Scenario 1)																
4	34,254	34,254	0	0	0	0	0	0	0	0	0	0	0	87,690	0	87,690
5	7,931	7,931	0	0	0	5,159	5,159	77	77	924	924	0	0	85,559	0	85,559
(Results of Scenario 6 duplicate Scenario 2)																
7	18,927	18,927	0	6,039	6,039	389	389	6	6	70	70	0	0	97,487	0	97,487
8	15,112	15,112	0	3,955	3,955	2,040	2,040	31	31	366	366	0	0	93,392	0	93,392
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	2,675	6,533	6,533	0	0	0	0	0	0	0	0	47,687	208,803	256,490
11	24,253	0	258	0	0	2,040	2,040	31	0	340	0	0	0	3,183	251,934	255,116
14	32,852	32,852	0	8,774	8,774	0	0	0	0	0	0	331	331	150,800	0	150,800
15	34,313	34,313	0	6,758	6,758	2,189	2,189	33	33	247	247	331	331	159,117	0	159,117
16	49,884	49,884	0	0	0	3,202	3,202	48	48	396	396	0	0	157,953	0	157,953

[a]Solutions under Scenario 12 and 13 were not obtained for Farm 12.

Table B13. Crop production levels and revenue for Farm 13

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	12,317	12,317	0	4,046	4,046	0	0	0	0	0	0	40	40	61,390	0	61,390
2	12,317	12,317	0	4,046	4,046	0	0	0	0	0	0	0	0	61,066	0	61,066
(Results of Scenario 3 duplicate Scenario 1)																
4	17,806	17,806	0	0	0	0	0	0	0	0	0	0	0	45,584	0	45,584
5	4,927	4,927	0	0	0	3,202	3,202	48	48	571	571	0	0	52,982	0	52,982
(Results of Scenario 6 duplicate Scenario 2)																
7	10,642	10,642	0	3,129	3,129	723	723	11	11	130	130	0	0	59,282	0	59,282
8	8,087	8,087	0	1,733	1,733	1,829	1,829	27	27	328	328	0	0	56,538	0	56,538
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	1,670	4,046	4,046	0	0	0	0	0	0	0	0	29,535	130,388	159,924
11	14,276	0	0	0	0	1,825	1,825	27	0	262	0	0	0	2,846	145,335	148,182
14	20,428	20,428	0	5,440	5,440	0	0	0	0	0	0	50	50	92,408	0	92,408
15	24,325	24,325	0	3,230	3,230	1,466	1,466	22	22	165	165	50	50	99,182	0	99,182
16	25,646	25,646	0	0	0	2,871	2,871	43	43	389	389	0	0	94,723	0	94,723

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 13.

Table B14. Crop production levels and revenue for Farm 14

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Proruction	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	14,532	14,532	0	4,794	4,794	0	0	0	0	0	0	0	0	72,195	0	72,195
(Results of Scenarios 2 and 3 duplicate Scenario 1)																
4	11,30	11,300	0	1,731	1,731	0	0	0	0	0	0	0	0	41,567	0	41,567
5	7,650	7,650	0	1,731	1,731	1,228	1,228	18	18	277	277	0	0	51,037	0	51,037
(Results of Scenario 6 duplicate Scenario 1)																
7	12,563	12,563	0	3,711	3,711	668	668	10	10	154	154	0	0	69,705	0	69,705
8	8,962	8,962	0	1,731	1,731	1,896	1,896	28	28	431	431	0	0	64,847	0	64,847
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	3,286	1,731	1,731	0	0	0	0	0	0	0	0	12,640	256,532	269,172
11	9,848	0	447	793	793	948	948	14	0	102	0	108	0	7,267	110,610	117,877
14	18,287	18,287	0	2,420	2,420	3,067	3,067	46	46	579	579	0	0	105,016	0	105,016
15	24,531	24,531	0	6,015	6,015	902	902	14	14	131	131	0	0	116,364	0	116,364
16	24,237	24,237	0	2,504	2,504	871	871	13	13	125	125	0	0	89,524	0	89,524

[a]Solutions under Scenarios 12 and 13 were obtained for Farm 1.

Table B15. Crop production levels and revenue for Farm 15

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	28,575	28,575	0	9,442	9,442	0	0	0	0	0	0	0	0	142,081	0	142,081
(Results of Scenarios 2 and 3 duplicate Scenario 1)																
4	46,999	46,999	0	2,435	2,435	0	0	0	0	0	0	0	0	138,095	0	138,095
5	20,576	20,576	0	4,389	4,389	4,757	4,757	71	71	615	615	0	0	131,196	0	131,196
(Results of Scenarios 6 and 7 duplicate Scenario 1)																
8	26,477	26,477	0	8,296	8,296	908	908	14	14	163	163	0	0	139,828	0	139,828
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	3,825	9,442	9,442	0	0	0	0	0	0	0	0	68,929	298,618	367,547
11	34,766	0	1,253	1,871	1,871	908	908	14	0	129	0	0	0	15,074	378,328	393,402
14	49,235	49,235	0	13,189	13,189	0	0	0	0	0	0	0	0	222,318	0	222,318
15	51,702	51,702	0	13,849	13,849	0	0	0	0	0	0	0	0	233,456	0	233,456
16	77,529	77,529	0	3,534	3,534	1,422	1,422	21	21	160	160	0	0	236,805	0	236,805

[a]Solutios under Scenarios 12 and 13 were not obtained for Farm 15.

Table B16. Crop production levels and revenue for Farm 16

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	20,487	20,487	0	6,763	6,763	0	0	0	0	0	0	0	0	101,815	0	101,815
(Results of Scenarios 2 and 3 duplicate Scenario 1)																
4	27,574	27,574	0	4,042	4,042	0	0	0	0	0	0	0	0	100,352	0	100,352
5	15,525	15,525	0	4,042	4,042	1,553	1,553	23	23	345	345	0	0	92,772	0	92,772
(Results of Scenarios 6 and 7 duplicate Scenario 1)																
8	19,779	20,487	0	6,375	6,375	220	220	3	3	49	49	0	0	100,535	0	100,535
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	2,919	6,375	6,375	0	0	0	0	0	0	0	0	46,536	227,906	274,442
11	22,380	0	807	2,609	2,609	445	445	7	0	83	0	0	0	19,743	243,529	263,282
14	35,219	35,219	0	9,425	9,425	0	0	0	0	0	0	0	0	158,961	0	158,961
15	37,076	37,076	0	9,921	0	0	0	0	0	0	0	0	0	167,341	0	167,341
16	47,471	47,471	0	5,875	5,875	342	342	5	5	48	48	0	0	167,997	0	167,997

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 16.

Table B17. Crop production levels and revenue for Farm 17

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	23,995	23,995	0	7,631	7,631	391	391	6	6	70	70	0	0	122,077	0	122,077
2	24,888	24,888	0	8,122	8,122	0	0	0	0	0	0	0	0	123,001	0	123,001
(Results of Scenario 3 duplicate Scenario 2)																
4	41,153	41,153	0	981	981	0	0	0	0	0	0	0	0	112,515	0	112,515
5	15,365	15,365	0	2,689	2,689	4,631	4,631	69	69	622	622	0	0	105,580	0	105,580
(Results of Scenarios 6 and 7 duplicate Scenario 1)																
8	21,235	21,235	0	6,105	6,105	1,588	1,588	24	24	284	284	0	0	118,998	0	118,998
9	15,960	15,960	0	2,689	2,689	5,022	5,022	75	75	692	692	0	0	112,045	0	112,045
10	0	0	3,529	7,031	7,631	0	0	0	0	0	0	0	0	55,708	275,454	331,162
11	5,399	0	3,520	0	0	1,196	1,196	18	0	99	0	0	0	1,866	329,737	331,603
14	41,438	41,438	0	10,661	10,661	635	635	10	10	107	107	0	0	191,549	0	191,549
15	44,510	44,510	0	11,525	11,525	529	529	8	8	59	59	0	0	202,735	0	202,735
16	66,074	66,074	0	1,424	1,424	2,488	2,488	37	37	314	314	0	0	203,443	0	203,443

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 17.

Table B18. Crop production levels and revenue for Farm 18

Scenario[a]	Corn Production	Corn Sold	Silage Production	Soybean Production	Soybeans Sold	Oat Production	Oats Sold	Straw Production	Straw Sold	Alfalfa Production	Alfalfa Sold	Pasture Production	Pasture Sold	Total Crop Revenue	Total Livestock Revenue	Total Revenue
	(bu)	(bu)	(tons)	(bu)	(bu)	(bu)	(bu)	(tons)	(tons)	(tons)	(tons)	(AUM)	(AUM)	($)	($)	($)
1	15,596	15,596	0	5,124	5,124	0	0	0	0	0	0	0	0	77,330	0	77,330
(Results of Scenarios 2 and 3 duplicate Scenario 1)																
4	18,869	18,869	0	0	0	0	0	0	0	0	0	0	0	48,305	0	48,305
5	6,890	6,890	0	822	822	2,867	2,867	43	43	374	374	0	0	51,861	0	51,861
6	13,578	13,578	0	4,030	4,030	869	869	13	13	144	144	0	0	74,473	0	74,473
(Results of Scenario 7 duplicate Scenario 6)																
8	10,731	10,731	0	2,466	2,476	2,108	2,108	32	32	344	344	0	0	70,223	0	70,223
(Results of Scenario 9 duplicate Scenario 5)																
10	0	0	2,938	3,327	3,327	0	0	0	0	0	0	0	0	24,288	22,935	253,646
11	6,053	0	1,277	0	0	1,071	1,071	16	0	111	0	0	0	1,670	161,319	162,989
12	15,021	3,261	0	4,937	4,937	0	0	0	0	0	0	58	0	44,388	90,825	135,214
13	11,760	0	0	710	710	1,968	1,968	32	0	210	210	58	0	20,385	90,825	111,210
14	27,076	27,076	0	7,210	7,210	0	0	0	0	0	0	0	0	121,947	0	121,947
15	27,919	27,919	0	7,435	7,435	0	0	0	0	0	0	0	0	125,753	0	125,753
16	39,148	39,148	0	0	0	2,224	2,224	33	33	299	299	0	0	122,625	0	122,625

APPENDIX C. PRODUCTION COSTS FOR EACH FARM AND EACH SCENARIO

Table C1. Production cost for Farm 1

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	872	0	83,548	9,226	6,458	0	27,725	16,705	18,592	10,623	7,195	0	0	0	0	24,835	58,336
2	676	0	71,620	7,582	6,458	0	27,725	16,705	18,592	10,623	5,865	0	0	0	0	23,023	53,550
-(Results of Scenario 3 duplicate Scenario 2)-																	
4	679	0	71,629	7,583	6,458	0	27,725	16,705	18,592	10,623	5,874	0	0	0	0	23,023	53,560
-(Results of Scenario 5 duplicate Scenario 4)-																	
6	679	0	71,629	7,583	6,458	0	27,725	16,705	18,592	10,623	5,874	0	28	0	0	23,023	53,588
7	679	0	71,629	7,583	6,458	0	27,725	16,705	18,592	10,623	5,874	0	56	0	0	23,023	53,616
8	676	0	71,573	7,566	6,590	0	27,725	16,705	18,592	10,623	5,862	0	50	0	0	22,991	53,682
-(Results of Scenario 9 duplicate Scenario 4)-																	
10	1,947	0	257,317	21,651	6,458	0	15,652	9,752	21,555	7,411	9,377	0	0	172,355	0	17,684	234,935
11	1,951	0	257,329	21,652	6,458	0	15,652	9,752	21,555	7,411	9,390	0	0	172,355	0	17,684	234,949
14	942	0	99,347	10,666	6,458	0	49,632	27,571	29,200	17,897	9,865	0	0	0	0	27,676	72,560
15	748	0	87,436	9,024	6,458	0	49,632	27,571	29,200	17,897	8,546	0	0	0	0	25,866	67,790
-(Results of Scenario 16 duplicate Scenario 15)-																	

[a]Solutions under Scenarios 12, and 13 were not obtained for Farm 1.

Table C2. Production cost for Farm 2

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	1,249	0	114,416	12,806	9,594	0	29,487	17,804	19,874	11,320	9,281	0	0	0	0	35,081	78,083
2	957	0	96,655	10,362	9,594	0	29,487	17,804	19,874	11,320	7,266	0	0	0	0	32,388	70,930
(Results of Scenarios 3, 4, 5, 6, 7, 8, and 9 duplicate Scenario 3)																	
10	2,686	491	357,070	30,406	10,405	1,496	22,575	8,070	19,414	7,669	13,473	0	0	233,486	0	25,283	322,709
(Results of Scenario 11 duplicate Scenario 10)																	
14	1,323	0	131,227	14,340	9,594	0	52,786	29,366	31,194	19,062	12,117	0	0	0	0	38,099	93,212
15	1,031	0	113,466	11,895	9,594	0	52,786	29,366	31,194	19,062	10,102	0	0	0	0	35,406	86,060
(Results of Scenario 16 duplicate Scenario 15)																	

[a]Solutions under Scenarios 12, and 13 were not obtained for Farm 2.

Table C3. Production cost for Farm 3

Scenario	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	796	0	76,126	8,411	5,904	0	24,731	15,111	16,824	9,561	6,552	0	0	0	0	22,669	53,097
2	620	0	65,223	6,909	5,904	0	24,731	15,111	16,824	9,561	5,340	0	0	0	0	21,012	48,726
(Results of Scenario 3 duplicate Scenario 2)																	
4	627	0	65,200	6,896	6,025	0	24,731	15,111	16,824	9,561	5,358	0	0	0	0	20,982	48,822
(Results of Scenario 5 duplicate Scenario 4)																	
6	629	0	65,253	6,911	5,904	0	24,731	15,111	16,824	9,561	5,369	0	175	0	0	21,012	48,932
7	627	0	65,200	6,896	6,025	0	24,731	15,111	16,824	9,561	5,358	0	226	0	0	20,982	49,048
8	617	0	65,026	6,844	6,432	0	24,731	15,111	16,824	9,561	5,321	0	315	0	0	20,883	49,357
(Results of Scenario 9 duplicate Scenario 4)																	
10	1,772	0	233,141	19,638	5,904	0	13,827	8,825	19,500	6,658	8,527	0	0	155,788	0	16,161	212,677
11	1,745	0	229,236	19,309	6,025	0	14,062	8,770	18,434	6,549	8,486	0	0	152,578	0	16,449	209,395
12	1,702	0	108,936	10,254	5,759	0	18,081	8,318	11,011	6,098	11,066	0	0	0	37,330	20,574	91,081
13	1,709	0	108,932	10,246	5,837	0	18,081	8,318	11,011	6,098	11,088	0	0	0	37,330	20,555	91,154
14	858	0	90,289	9,702	5,904	0	44,272	24,939	26,421	16,102	8,940	0	0	0	0	25,209	65,857
15	692	0	79,522	8,213	5,904	0	44,272	24,939	26,421	16,102	7,789	0	0	0	0	23,586	61,594
16	689	0	79,455	8,196	6,025	0	44,272	24,939	26,421	16,102	7,773	0	0	0	0	23,552	61,647

Table C4. Production cost for Farm 4

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	869	0	83,000	9,173	6,458	0	25,667	16,222	18,050	10,265	7,095	0	0	0	0	24,885	57,875
2	673	0	71,072	7,529	6,458	0	26,567	16,222	18,050	10,265	5,765	0	0	0	0	23,073	53,089
(Results of Scenario 3 duplicate Scenario 2)																	
4	652	0	70,655	7,405	7,442	0	26,567	16,222	18,050	10,265	5,680	0	0	0	0	22,833	53,625
(Results of Scenario 5 duplicate Scenario 4)																	
6	673	0	71,072	7,529	6,458	0	26,567	16,222	18,050	10,265	5,765	0	523	0	0	23,073	53,612
7	652	0	70,655	7,405	7,442	0	26,567	16,222	18,050	10,265	5,680	0	314	0	0	22,833	53,939
8	652	0	70,655	7,405	7,442	0	26,567	16,222	18,050	10,265	5,680	0	941	0	0	22,833	54,566
(Results of Scenario 9 duplicate Scenario 4)																	
10	1,910	0	251,133	21,192	6,458	0	14,812	9,459	20,902	7,136	9,189	0	0	166,971	0	17,820	228,765
11	1,561	0	218,787	18,467	7,129	38	15,493	9,181	13,827	6,307	7,126	0	0	140,909	0	19,862	199,838
14	936	0	98,226	10,560	6,458	0	47,558	26,775	28,350	17,289	9,665	0	0	0	0	27,619	71,591
15	728	0	86,143	8,857	6,997	0	47,558	26,775	28,350	17,289	8,311	0	0	0	0	25,699	67,152
16	719	0	85,954	8,801	7,442	0	47,558	26,775	28,350	17,289	8,272	0	0	0	0	25,590	67,395

[a]Solutions under Scenarios 12, and 13 were not obtained for Farm 4.

Table C5. Production cost for Farm 5

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	780	0	72,037	8,045	5,904	0	19,865	12,682	14,124	7,900	5,791	0	0	0	0	21,704	49,345
2	607	0	61,280	6,553	5,904	0	19,856	12,682	14,124	7,900	4,725	0	0	0	0	20,048	45,130
(Results of Scenario 3 duplicate Scenario 2)																	
4	578	0	61,218	6,460	7,241	0	19,865	12,682	14,124	7,900	4,616	498	0	0	0	19,721	46,435
(Results of Scenario 5 duplicate Scenario 4)																	
6	601	0	61,187	6,520	6,168	0	19,865	12,682	14,124	7,900	4,701	0	802	0	0	19,983	46,075
7	578	0	60,720	6,386	7,241	0	19,865	12,682	14,124	7,900	4,616	0	722	0	0	19,721	46,586
8	578	0	60,720	6,386	7,241	0	19,865	12,682	14,124	7,900	4,616	0	2,166	0	0	19,721	48,030
9	578	0	60,987	6,424	7,241	0	19,865	12,682	14,124	7,900	4,616	266	0	0	0	19,721	46,168
10	1,608	0	204,612	17,514	5,904	0	10,630	7,300	16,147	5,397	7,592	0	0	132,089	0	15,644	184,140
11	1,203	0	167,933	14,373	6,764	120	11,513	7,027	8,353	4,511	5,200	193	0	102,768	0	18,084	152,013
14	853	0	83,532	9,140	5,373	195	32,134	21,586	26,749	13,537	7,714	0	0	0	0	23,228	59,187
15	631	0	72,603	7,472	7,241	0	35,560	20,929	22,179	13,291	6,648	0	0	0	0	21,884	56,535
16	631	0	73,082	7,544	7,241	0	35,560	20,929	22,179	13,291	6,643	498	0	0	0	21,878	57,093

[a]Solutions under Scenarios 12, and 13 were not obtained for Farm 5.

Table C6. Production cost for Farm 6

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	439	0	41,080	4,567	3,321	0	12,008	7,127	7,940	4,558	3,392	0	0	0	0	12,521	28,360
2	338	0	34,946	3,722	3,321	0	12,008	7,127	7,940	4,558	2,708	0	0	0	0	11,589	25,898
(Results of Scenario 3 duplicate Scenario 2)																	
4	327	0	34,736	3,660	3,816	0	12,008	7,127	7,940	4,558	2,665	0	0	0	0	11,468	26,168
(Results of Scenario 5 duplicate Scenario 4)																	
6	338	0	34,946	3,722	3,321	0	12,008	7,127	7,940	4,558	2,708	0	277	0	0	11,589	26,176
7	327	0	34,736	3,660	3,816	0	12,008	7,127	7,940	4,558	2,665	0	166	0	0	11,468	26,334
8	327	0	34,736	3,660	3,816	0	12,008	7,127	7,940	4,558	2,665	0	499	0	0	11,468	26,667
(Results of Scenario 9 duplicate Scenario 4)																	
10	899	0	115,435	9,878	3,321	0	6,781	4,102	9,070	3,145	4,316	0	0	74,181	0	9,115	103,955
11	747	0	101,500	8,670	3,701	19	7,098	4,048	6,439	2,860	3,423	0	0	63,173	0	9,973	91,819
14	468	0	47,759	5,175	3,321	0	21,496	11,760	12,467	7,681	4,507	0	0	0	0	13,707	34,390
15	362	0	41,573	4,304	3,569	0	21,496	11,760	12,467	7,681	3,817	0	0	0	0	12,731	32,101
16	357	0	41,482	4,274	3,816	0	21,496	11,760	12,467	7,681	3,800	0	0	0	0	12,675	32,246

[a]Solutions under Scenarios 12, and 13 were not obtained for Farm 6.

Table C7. Production cost for Farm 7

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	805	0	77,816	8,571	5,904	0	25,803	16,448	18,302	10,250	6,720	0	0	0	0	23,117	54,561
2	636	0	66,997	7,075	5,904	0	25,803	16,448	18,302	10,250	5,592	0	0	0	0	21,460	50,280
-(Results of Scenario 3 dupcliate Scenario 2)																	
4	598	0	70,401	7,465	7,664	0	25,803	16,448	18,302	10,350	5,439	451	0	0	0	21,030	55,998
5	647	0	66,604	7,006	6,824	138	21,376	17,379	24,658	10,644	5,398	0	0	0	0	20,253	50,263
6	626	0	66,809	7,019	6,344	0	25,803	16,448	18,302	10,250	5,552	0	1,201	0	0	21,352	51,718
7	598	0	66,250	6,854	7,664	0	25,803	16,448	18,302	10,250	5,439	0	1,184	0	0	21,030	52,420
8	598	0	66,250	6,854	7,664	0	25,803	16,448	18,302	10,250	5,439	0	3,553	0	0	21,030	54,789
-(Results of Scenario 9 duplicate Scenario 5)																	
10	1,877	0	249,003	20,817	5,904	0	13,937	9,592	21,197	7,085	8,981	0	0	169,367	0	16,362	228,515
11	1,835	0	196,243	17,103	6,548	394	14,224	9,066	9,906	5,628	7,889	0	0	130,923	0	19,771	187,346
12	1,718	0	110,784	10,426	5,777	0	19,150	9,653	12,490	6,786	11,326	0	0	0	37,330	21,069	92,714
13	1,726	0	109,953	10,279	6,732	127	15,104	10,504	18,300	7,147	11,139	0	0	0	36,406	19,938	91,768
14	870	0	92,816	9,935	5,904	0	46,191	27,149	28,745	17,246	9,233	0	0	0	0	25,789	68,107
15	667	0	81,700	8,266	7,664	0	46,191	27,149	28,745	17,246	8,086	0	0	0	0	23,846	65,108
16	679	0	87,853	8,740	7,666	814	62,699	28,437	27,077	19,705	9,249	0	0	0	0	25,393	71,567

Table C8. Production cost for Farm 8

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	774	0	74,241	8,196	5,720	0	23,976	15,082	16,802	9,445	6,293	0	0	0	0	22,197	51,851
2	617	0	63,795	6,750	5,720	0	23,976	15,082	16,802	9,445	5,235	0	0	0	0	20,592	47,741
(Results of Scenario 3 duplicate Scenario 2)																	
4	634	0	69,094	7,085	6,398	1,252	37,142	15,619	14,613	11,171	6,199	0	0	0	0	21,970	54,075
5	716	0	64,086	6,955	4,766	227	16,929	16,513	27,487	10,127	5,196	0	0	0	0	18,804	46,074
6	619	0	63,560	6,669	6,396	0	23,976	15,082	16,802	9,445	5,228	0	672	0	0	20,427	48,837
7	619	0	63,560	6,669	6,396	0	23,976	15,082	16,802	9,445	5,228	0	1,345	0	0	20,427	49,509
8	602	0	63,231	6,572	7,166	0	23,976	15,082	16,802	9,445	5,158	0	3,102	0	0	20,239	51,682
(Results of Scenario 9 duplicate Scenario 5)																	
10	1,763	0	230,885	19,399	5,720	0	13,119	8,812	19,462	6,551	8,396	0	0	155,170	0	15,815	211,051
11	1,697	0	243,615	20,024	6,765	1,100	21,859	7,152	9,856	6,174	7,711	0	0	167,358	0	18,067	227,200
14	833	0	87,867	9,432	5,720	0	42,920	24,888	26,383	15,895	8,547	0	0	0	0	24,594	64,188
15	693	0	79,233	8,202	5,978	0	42,920	24,888	26,383	15,895	7,770	0	0	0	0	23,296	61,141
16	701	0	86,635	8,649	6,398	1,252	66,489	26,646	23,860	19,366	9,323	0	0	0	0	25,258	70,247

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 8.

Table C9. Production cost for Farm 9

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	676	0	60,293	7,061	3,985	0	13,354	8,997	9,959	5,494	3,944	0	0	0	0	15,948	36,432
2	419	0	41,541	4,436	3,985	0	13,354	8,517	9,479	5,307	3,224	0	0	0	0	13,713	30,665
3	569	0	53,046	6,055	3,985	0	13,354	8,997	9,959	5,494	3,237	0	0	0	0	14,830	33,601
4	406	0	50,774	5,425	5,175	1,099	22,434	8,892	7,979	6,499	3,812	5,603	0	0	0	14,521	42,135
5	511	0	41,973	4,663	3,261	220	7,562	10,009	19,974	6,158	3,194	0	0	0	0	11,529	29,025
6	420	0	41,328	4,364	4,579	0	13,354	8,517	9,479	5,307	3,211	0	711	0	0	13,568	31,740
7	420	0	41,328	4,364	4,579	0	13,354	8,517	9,479	5,307	3,211	0	1,422	0	0	13,568	32,451
8	524	0	42,011	4,666	3,261	220	7,562	10,009	19,974	6,158	3,233	0	484	0	0	11,529	29,550
(Results of Scenario 9 duplicate Scenario 5)																	
10	1,101	0	138,843	11,875	3,985	0	7,205	4,908	10,875	3,639	5,192	0	0	89,612	0	10,749	125,052
11	1,691	0	112,041	9,940	3,407	419	4,248	4,878	6,964	2,747	7,264	0	0	66,091	0	12,451	102,320
12	1,530	0	87,907	8,100	3,985	0	7,234	2,111	4,094	2,074	9,071	0	0	0	37,330	13,885	74,446
13	1,564	0	85,495	7,938	3,240	438	3,238	2,646	9,741	2,337	9,097	0	0	0	36,484	12,213	71,747
14	1,012	0	82,091	9,404	3,322	733	16,353	19,827	38,970	12,319	6,880	0	0	0	0	21,010	53,669
15	851	0	74,041	8,038	6,072	293	23,906	18,430	28,943	11,796	6,249	0	0	0	0	20,751	53,199
16	537	0	50,515	5,390	3,422	440	16,353	15,455	24,916	9,452	4,643	0	0	0	0	13,927	37,274

Table C10. Production cost for Farm 10

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	849	0	78,656	8,773	6,458	0	21,095	13,220	14,698	8,286	6,579	0	0	0	0	23,906	54,001
2	685	0	66,769	7,133	6,458	0	21,095	13,220	14,698	8,286	5,290	0	0	0	0	22,093	49,260
-(Results of Scenario 3 duplicate Scenario 2)-																	
4	373	0	41,242	4,207	4,220	855	22,413	8,883	8,045	6,502	3,703	0	0	0	0	13,024	32,512
5	881	0	67,578	7,624	4,342	473	9,868	15,665	32,698	9,535	5,298	0	0	0	0	18,212	45,483
6	661	0	66,210	6,964	7,805	0	21,095	13,220	14,698	8,286	5,186	0	1,638	0	0	21,764	51,645
7	655	0	66,096	6,930	8,075	0	21,095	13,220	14,698	8,286	5,164	0	3,065	0	0	21,699	53,218
8	824	0	67,254	7,443	5,532	328	14,062	14,965	27,190	9,272	5,304	0	2,507	0	0	18,917	49,304
-(Results of Scenario 9 duplicate Scenario 5)-																	
10	2,190	0	279,404	23,573	6,461	1,639	18,254	5,628	14,232	5,783	10,652	0	0	188,851	0	17,264	254,223
11	2,358	0	208,283	17,905	5,774	1,511	15,402	6,295	6,678	4,657	10,221	0	0	130,957	0	20,557	191,582
14	982	0	86,702	9,710	4,082	328	25,173	23,924	41,250	14,934	7,792	0	0	0	0	22,209	59,053
15	717	0	78,677	8,103	7,805	0	37,763	21,825	23,089	13,950	7,317	0	0	0	0	24,032	61,207
16	866	0	86,546	9,071	5,466	1,511	44,233	24,637	33,341	16,846	8,621	0	0	0	0	24,071	65,586

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 10.

Table C11. Production cost for Farm 11

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	1,085	0	99,686	11,146	8,303	0	25,877	15,977	17,765	10,068	8,127	0	0	0	0	30,505	68,149
2	876	0	84,474	9,042	8,303	0	25,877	15,977	17,765	10,068	6,541	0	0	0	0	28,175	62,129
-(Results of Scenario 3 duplicate Scenario 2)																	
4	395	0	43,503	4,471	4,224	916	23,108	9,083	8,286	6,682	3,787	0	0	0	0	13,860	33,940
5	1,204	0	86,517	9,982	4,177	688	9,520	20,163	47,235	12,445	6,639	0	0	0	0	21,927	55,858
6	834	0	83,674	8,808	10,162	0	25,877	15,977	17,765	10,068	6,369	0	2,073	0	0	27,721	65,200
7	834	0	83,674	8,808	10,162	0	25,877	15,977	17,765	10,068	6,369	0	4,146	0	0	27,721	67,273
8	1,106	0	85,736	9,868	5,770	505	15,044	18,729	37,194	11,626	6,632	0	2,703	0	0	23,556	60,660
-(Results of Scenario 9 duplicate Scenario 5)																	
10	2,752	0	348,108	29,475	8,307	2,090	22,789	6,547	16,780	6,972	13,315	0	0	233,486	0	22,158	315,801
11	3,547	0	263,659	23,090	6,143	1,926	15,013	8,150	13,109	5,876	15,597	0	0	162,723	0	25,258	240,611
14	1,274	0	108,158	12,233	4,643	505	26,930	29,709	56,170	18,532	9,309	0	0	0	0	27,164	72,386
15	901	0	98,839	10,194	10,162	0	46,323	26,374	27,906	16,955	8,961	0	0	0	0	30,479	76,750
16	1,134	0	108,107	11,506	6,143	1,926	47,698	30,141	44,863	20,199	10,412	0	0	0	0	29,880	80,067

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 11.

Table C12. Production cost for Farm 12

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	826	0	75,282	8,593	5,314	0	19,828	13,035	14,476	8,033	5,622	0	0	0	0	21,033	48,594
2	586	0	57,499	6,105	5,314	0	19,828	12,622	14,103	7,887	4,677	0	0	0	0	18,827	42,809
3	702	0	65,616	7,251	5,314	0	19,828	13,035	14,476	8,033	4,677	0	0	0	0	19,542	44,816
4	529	0	68,932	7,078	6,232	2,647	45,558	12,845	8,564	10,874	6,152	5,707	0	0	0	19,934	58,624
5	869	0	61,384	7,204	1,798	586	1,031	17,972	49,491	10,936	4,474	1,743	0	0	0	13,026	39,768
6	550	0	56,822	5,905	6,898	0	19,828	12,662	14,103	7,887	4,534	0	1,885	0	0	18,441	45,549
7	581	0	57,088	6,006	6,402	57	18,404	13,067	16,792	8,120	4,554	0	3,117	0	0	17,944	46,199
8	692	0	58,049	6,367	4,631	261	12,377	14,770	28,126	9,096	4,560	0	4,616	0	0	16,400	45,631
9	869	0	60,573	7,078	1,798	586	1,031	17,972	49,491	10,936	4,474	932	0	0	0	13,025	38,830
10	1,579	0	200,138	16,952	5,314	0	10,725	7,351	16,262	5,438	7,487	0	0	131,924	0	14,638	181,749
11	2,828	0	210,416	18,377	4,673	1,942	20,462	5,561	5,126	4,981	12,236	1,743	0	142,841	0	18,015	204,810
14	872	0	86,144	9,576	5,314	0	35,495	21,268	22,519	13,414	7,313	0	0	0	0	22,837	58,453
15	808	0	80,374	8,747	4,968	458	31,374	22,765	31,633	14,335	6,861	0	0	0	0	21,110	56,479
16	749	0	84,058	8,625	4,784	2,093	56,925	25,483	33,778	18,903	8,841	1,743	0	0	0	22,129	67,118

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 12.

Table C13. Production cost for Farm 13

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	488	0	45,487	4,796	3,561	0	12,317	7,912	8,800	4,917	3,674	0	0	0	0	13,548	30,496
2	389	0	37,709	4,014	3,561	0	12,317	7,855	8,743	4,895	3,024	0	0	0	0	12,477	27,970
3	405	0	38,988	4,196	3,561	0	12,317	7,912	8,800	4,917	3,020	0	0	0	0	12,572	28,266
4	285	0	36,914	3,799	3,380	1,435	23,682	6,677	4,452	5,653	3,251	3,128	0	0	0	10,711	31,357
5	578	0	42,054	5,011	1,205	393	640	11,125	30,616	6,767	2,938	2,968	0	0	0	8,655	27,937
6	365	0	37,254	3,880	4,622	0	12,317	7,855	8,743	4,895	2,928	0	1,607	0	0	12,218	30,149
7	422	0	37,750	4,067	3,702	106	9,671	8,608	13,739	5,327	2,966	0	2,001	0	0	11,294	29,463
8	496	0	38,393	4,309	2,515	242	5,633	9,749	21,333	5,981	2,970	0	2,831	0	0	10,058	28,907
(Results of Scenario 9 duplicate Scenario 1)																	
10	1,016	0	127,047	10,834	3,561	0	6,642	4,533	10,039	3,359	4,825	0	0	82,379	0	9,783	114,740
11	2,058	0	130,335	11,489	2,621	1,134	8,757	3,912	5,242	2,911	8,911	2,980	0	80,946	0	11,698	122,690
14	515	0	52,156	5,696	3,561	0	22,048	13,022	13,789	8,257	4,720	0	0	0	0	14,684	36,918
15	466	0	49,291	5,124	3,837	645	24,032	14,385	19,398	9,576	4,669	0	0	0	0	13,802	37,653
16	527	0	54,207	5,815	2,617	1,132	26,058	16,098	26,976	11,232	5,135	2,968	0	0	0	13,237	42,136

[a]Solutions under Scenario 12 and 13 were not obtained for Farm 13.

Table C14. Production cost for Farm 14

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	714	0	64,562	7,255	5,535	0	14,532	9,284	10,344	5,782	5,160	0	0	0	0	20,023	43,756
2	573	0	54,399	5,851	5,535	0	14,532	9,284	10,344	5,782	4,080	0	0	0	0	18,469	39,719
-(Results of Scenario 3 duplicate Scenario 2)-																	
4	301	0	32,397	3,329	3,953	764	13,297	5,623	5,249	4,010	2,562	0	0	0	0	10,672	25,290
5	549	0	41,659	4,726	2,998	275	5,561	8,620	18,203	5,290	3,126	0	0	0	0	11,348	27,763
6	559	0	53,927	5,707	6,690	0	14,532	9,284	10,344	5,782	3,998	0	1,795	0	0	18,188	42,160
7	641	0	54,580	5,970	5,362	153	11,422	10,108	16,048	6,254	4,090	0	2,115	0	0	16,941	40,885
8	777	0	55,482	6,375	3,467	428	5,731	11,539	26,241	7,067	4,203	0	1,538	0	0	14,567	37,645
-(Results of Scenario 9 duplicate Scenario 5)-																	
10	1,913	0	240,941	2,4085	5,539	1,388	16,197	2,727	8,283	3,998	9,379	0	0	162,076	0	14,756	217,620
11	1,023	0	106,415	9,292	3,645	1,221	8,798	3,633	4,653	2,771	4,190	0	0	60,363	0	12,220	93,702
14	853	0	69,426	7,945	2,713	580	11,753	17,847	36,625	10,859	5,879	0	0	0	0	17,495	45,473
15	632	0	62,637	6,577	6,398	130	21,824	15,855	20,940	9,849	5,450	0	0	0	0	18,994	47,397
16	560	0	51,884	5,376	4,418	1,008	25,335	13,123	16,136	9,026	4,891	0	0	0	0	15,279	39,998

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 14.

Table C15. Production cost for Farm 15

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	970	0	92,597	10,234	7,196	0	28,575	18,269	20,363	11,377	7,985	0	0	0	0	27,764	64,555
2	790	0	79,398	8,410	7,196	0	28,575	18,269	20,363	11,377	6,595	0	0	0	0	25,744	59,322
(Results of Scenario 3 duplicate Scenario 2)																	
4	799	0	95,719	9,753	8,835	3,023	60,075	19,573	15,159	15,514	8,780	3,710	0	0	0	29,054	78,669
5	972	0	80,218	8,854	5,314	531	12,633	21,737	44,425	12,969	6,386	0	0	0	0	22,015	56,069
6	765	0	78,734	8,207	8,829	0	28,575	18,269	20,363	11,377	6,482	0	1,352	0	0	25,346	61,592
7	765	0	78,734	8,207	8,829	0	28,575	18,269	20,363	11,377	6,482	0	2,703	0	0	25,346	62,944
8	814	0	79,035	8,340	8,367	112	25,260	19,206	26,597	11,914	6,431	0	5,383	0	0	24,206	64,753
(Results of Scenario 9 duplicate Scenario 5)																	
10	2,195	0	282,888	23,841	7,196	0	15,476	10,668	23,569	7,875	10,512	0	0	188,666	0	19,868	257,958
11	2,032	0	318,387	25,786	8,423	2,862	39,084	6,461	0	7,216	8,820	0	0	221,858	0	26,021	300,986
14	1,038	0	108,834	11,704	7,196	0	51,153	30,144	31,971	19,137	10,650	0	0	0	0	30,597	79,284
15	830	0	96,020	9,791	8,829	0	51,153	30,144	31,971	19,137	9,435	0	0	0	0	28,527	75,718
16	928	0	114,540	11,351	7,942	2,688	93,918	34,598	33,048	26,457	12,816	0	0	0	0	32,495	93,748

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 15.

Table C16. Production cost for Farm 16

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	783	0	73,074	8,133	5,904	0	20,873	13,093	14,590	8,208	6,030	0	0	0	0	22,075	50,350
2	630	0	62,294	6,640	5,904	0	20,873	13,093	14,590	8,208	4,941	0	0	0	0	20,418	46,111
(Results of Scenario 3 duplicate Scenario 2)																	
4	622	0	69,566	7,228	7,331	1,425	33,161	13,611	12,577	9,827	5,754	2,368	0	0	0	21,528	55,462
5	756	0	64,103	6,904	4,850	285	13,033	14,511	26,865	8,966	4,867	0	0	0	0	17,574	43,446
6	612	0	61,844	6,502	7,010	0	20,873	13,093	14,590	7,119	4,864	0	1,419	0	0	20,148	47,061
7	606	0	61,711	6,462	7,329	0	20,873	13,093	14,590	7,119	4,838	0	2,587	0	0	20,070	48,405
8	622	0	61,680	6,490	7,274	45	19,753	13,298	16,350	8,318	4,821	0	6,510	0	0	19,065	53,062
9	756	0	63,294	7,029	4,850	285	13,033	14,511	26,865	8,966	486	931	0	0	0	17,574	44,503
10	1,728	0	219,534	18,661	5,904	224	12,814	7,408	16,666	5,794	8,231	0	0	143,990	0	15,924	198,729
11	1,435	0	215,071	17,772	6,647	1,797	24,104	5,222	1,168	4,925	6,150	0	0	142,862	0	20,034	200,187
14	832	0	84,720	91,186	5,904	0	37,365	21,604	22,908	13,813	7,931	0	0	0	0	24,095	60,929
15	668	0	74,308	7,643	7,010	0	37,365	21,604	22,908	13,813	7,008	0	0	0	0	22,430	57,903
16	698	0	83,442	8,490	6,974	1,291	54,763	23,216	22,589	16,646	8,340	1,741	0	0	0	23,957	67,439

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 16.

Table C17. Production cost for Farm 17

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	863	0	79,964	8,896	5,771	69	23,478	16,239	20,280	10,105	6,822	0	0	0	0	23,461	55,124
2	694	0	69,116	7,321	6,273	0	24,888	15,830	17,592	9,870	5,737	0	0	0	0	22,436	51,636
3	694	0	69,116	7,321	6,273	0	24,888	15,830	17,592	9,870	5,737	0	0	0	0	22,436	51,636
4	626	0	80,680	8,264	7,147	2,769	53,752	16,217	11,662	13,303	7,364	5,645	0	0	0	23,470	67,962
5	794	0	63,960	7,112	3,796	491	7,750	18,476	40,929	10,985	5,032	0	0	0	0	16,715	44,132
6	693	0	68,715	7,231	7,354	69	23,478	16,239	20,280	10,105	5,627	0	1,414	0	0	21,444	53,245
7	693	0	68,715	7,231	7,354	69	23,478	16,239	20,280	10,105	5,627	0	2,829	0	0	21,444	54,660
8	768	0	69,363	7,476	6,150	208	19,116	17,460	28,468	10,807	5,611	0	5,703	0	0	20,171	56,125
9	893	0	71,964	8,102	4,008	561	7,828	19,835	44,676	11,812	5,507	1,698	0	0	0	18,189	49,878
10	2,007	0	258,452	21,723	6,274	346	14,803	8,798	19,821	6,826	9,607	0	0	174,031	0	17,318	236,124
11	2,148	0	271,962	22,073	5,973	2,603	33,753	5,027	0	6,083	9,295	0	0	191,794	0	20,744	258,565
14	923	0	93,991	10,169	5,771	69	42,028	26,647	31,559	16,866	9,081	0	0	0	0	25,867	67,822
15	745	0	83,667	8,562	7,599	59	42,653	26,424	29,900	16,694	8,212	0	0	0	0	24,514	65,640
16	854	0	103,562	10,527	6,256	2,423	78,437	31,138	35,304	23,625	11,159	3,175	0	0	0	27,451	84,615

[a]Solutions under Scenarios 12 and 13 were not obtained for Farm 17.

Table C18. Production cost for Farm 18

Scenario[a]	Labor Requirement	Labor Cost	Capital Requirement	Capital Cost	Herbicide Cost	Insecticide Cost	Nitrogen	Phosphorus	Potassium	Fertilizer Cost	Fuel Cost	Terracing Cost	Conservation Tax	Beef Cost	Swine Cost	Other Cost	Total Cost
	Hrs.	$	$	$	$	$	lb.	lb.	lb.	$	$	$	$	$	$	$	$
1	740	0	66,920	7,521	5,720	0	15,596	9,948	11,072	6,198	5,130	0	0	0	0	20,773	45,342
2	607	0	57,478	6,208	5,720	0	15,596	9,948	11,072	6,198	4,242	0	0	0	0	19,313	41,680
(Results of Scenario 3 duplicate Scenario 2)																	
4	338	0	38,720	3,853	4,075	1,731	25,096	7,076	4,717	5,990	3,610	0	0	0	0	12,281	31,540
5	583	0	41,348	4,760	2,205	406	2,393	9,626	23,007	5,695	3,160	0	0	0	0	10,581	26,807
6	670	0	56,652	6,194	5,778	189	12,408	10,672	16,493	6,598	4,253	1,446	0	0	0	17,255	41,713
7	670	0	56,652	6,194	5,778	189	12,408	10,672	16,493	6,598	4,253	2,892	0	0	0	17,255	43,159
8	779	0	57,414	6,533	4,025	391	7,908	11,662	24,058	7,143	4,385	4,533	0	0	0	15,580	42,590
(Results of Scenario 9 duplicate Scenario 5)																	
10	1,799	0	221,381	18,946	5,722	1,425	13,471	4,146	10,545	4,271	8,549	0	0	144,907	0	15,225	199,046
11	1,484	0	142,662	12,047	3,840	1,627	14,438	2,917	1,176	2,950	6,426	0	0	92,718	0	13,146	132,755
12	1,680	0	100,663	9,511	5,426	0	9,696	3,208	5,207	2,849	9,903	0	0	0	37,330	18,393	83,412
13	1,596	0	85,655	7,976	3,068	947	4,625	2,297	10,193	2,491	9,245	0	0	0	35,854	12,033	71,613
14	778	0	75,862	8,332	5,720	0	27,919	16,418	17,390	10,428	6,611	0	0	0	0	22,347	53,439
15	635	0	65,657	6,860	6,314	0	27,919	16,418	17,390	10,428	5,733	0	0	0	0	20,716	50,051
16	778	0	85,367	9,264	4,925	2,111	46,423	19,758	25,805	14,930	7,733	0	8,685	0	0	20,977	68,626

APPENDIX D. RANGE ANALYSIS FOR SELECTED ACTIVITIES ON FARMS 3, 9, 17, AND 18

Table D1. Range analysis for selected activities on Farm 3.

Selected Activities	Activity Level	Input Cost	Range of costs where activity level remains unchanged	
			Upper Cost	Lower Cost
CB, till-plant, none, 107A1	144	-65.51	-68.50	∞
CB, slot-plant, none, 107A1	0	-64.16	- ∞	-61.17
CB, conventional, none, 107A1	0	-70.68	- ∞	-57.01
CB, chisel-plow, none, 107A1	0	-68.10	- ∞	-60.58
C, till-plant, none, 107A1	0	-78.87	- ∞	-24.40
CB, till-plant, none, 55A1	80	-66.33	-66.70	∞
CB, till-plant, none, 138B1	74	-65.51	-65.93	-65.17
CB, till-plant, none, 138C2	22	-64.76	-65.07	-57.17
CB, conventional, terrace, 138C2	0	-69.94	- ∞	-36.03
CB, chisel-plow, terrace, 138C2	0	-67.36	- ∞	-39.81
Buy herbicides	5,904	-1.00	-1.34	-0.60
Buy diesel	2,025	-1.30	-3.04	0.09
Buy LP gas	3,948	-0.69	-4.42	0.05
Borrow short-term capital	38,330	-0.075	-0.21	0.0
Borrow medium term capital	26,894	-0.15	-0.31	-0.04
Buy nitrogen	24,731	-0.14	-0.53	0.01
Buy phopsphorous	15,111	-0.27	-1.47	0.02
Buy potash	16,824	-0.12	-0.85	0.01
Sell corn	23,681	2.56	1.93	3.34
Sell soybeans	7,788	7.30	6.17	9.05
Sell alfalfa hay	0	57.73	- ∞	65.71
Sell oats	0	1.56	-0.75	2.64
Sell pasture	0	8.00	- ∞	29.99

Table D2. Range analysis for selected activities on Farm 9

Selected Activities	Activity Level	Input Cost	Range of costs where activity level remains unchanged	
			Upper Cost	Lower Cost
P, conventional, none, 65E2	144	-7.76	-8.06	∞
CB, till-plant, none, 131B1	108	-64.23	-67.64	∞
CB, slot-plant, none, 131B1	0	-62.89	- ∞	-59.48
CB, conventional, none, 131B1	0	-69.41	- ∞	-56.21
CB, chisel-plow, none, 131B1	0	-66.83	- ∞	-59.53
CB, till-plant, contour, 132C2	108	-62.74	-65.71	-61.60
CB, slot-plant, contour, 132C2	0	-61.39	- ∞	-58.42
Buy herbicides	3,985	-1.00	-1.20	-0.65
Buy diesel	1,316	-1.30	-5.00	-0.91
Buy LP gas	2,226	-0.69	-0.87	-0.05
Borrow short-term capital	25,355	-0.075	-0.11	0.00
Borrow medium term capital	27,691	-0.150	-0.154	-0.10
Buy nitrogen	13,354	-0.14	-0.21	-0.01
Buy phopsphorous	8,997	-0.27	-0.36	-0.20
Buy potash	9,959	-0.12	-0.21	-0.11
Sell corn	13,354	2.56	2.52	2.98
Sell soybeans	4,386	7.30	7.21	8.57
Sell alfalfa hay	0	57.73	- ∞	58.12
Sell oats	0	1.56	- ∞	3.77
Sell pasture	373	8.00	7.88	25.52

Table D3. Range analysis for selected activities on Farm 17

Selected Activities	Activity Level	Input Cost	Range of costs where activity level remains unchanged	
			Upper Cost	Lower Cost
CB, till-plant, contour, 120C2	204	-66.61	-69.58	∞
CB, till-plant, contour, 162D2	68	-65.21	-68.18	∞
CB, slot-plant, contour, 162D2	0	-63.87	- ∞	-60.90
CB, conventional, terrace, 162D2	0	-70.39	- ∞	-56.51
CB, till-plant, none, 119A1	34	-68.05	-71.09	∞
CB, till-plant, contour, 24E2	34	-61.76	-61.76	-53.41
P, conventional, none, 24E2	0	-8.49	- ∞	63.91
Buy herbicides	6,273	-1.00	-1.38	-0.46
Buy diesel	2,224	-1.30	-8.48	0.10
Buy LP gas	4,149	-0.69	-2.78	0.05
Borrow short-term capital	40,619	-0.075	-0.45	0.00
Borrow medium term capital	28,498	-0.15	-0.58	-0.05
Buy nitrogen	24,888	-0.14	-0.36	0.01
Buy phopsphorous	15,830	-0.27	-2.10	0.02
Buy potash	17,592	-0.12	-1.77	0.00
Sell corn	24,888	2.56	2.21	3.37
Sell soybeans	8,122	7.30	6.66	116.66
Sell alfalfa hay	0	57.73	- ∞	62.18
Sell oats	0	1.56	-0.75	2.36
Sell pasture	0	8.00	0	19.01

Table D4. Range analysis for selected activities on Farm 18

Selected Activities	Activity Level	Input Cost	Range of costs where activity level remains unchanged	
			Upper Cost	Lower Cost
CB, till-plant, contour, 1D3	47	-61.14	-64.06	∞
COMMM, slot-plant, contour, 1D3	0	-43.05	- ∞	-36.96
P, conventional, none, 1D3	0	-3.95	- ∞	29.90
CB, till-plant contour, 1E3	93	-59.79	-59.90	-55.05
COMMM, slot-plant, contour, 1E3	0	-42.36	-42.42	-42.32
P, conventional, none, 1E3	0	-1.94	-20.97	20.04
CB, spring-disk, none, 10C2	56	-64.58	-64.59	∞
CB, till-plant, contour, 10C2	0	-63.24	-∞	63.23
CB, spring-disk, none, 10D2	52	-63.16	-63.16	∞
CB, till-plant, contour, 10D2	0	-61.81	- ∞	61.81
CB, slot-plant, contour, 10D2	0	-60.47	- ∞	-60.43
CB, till-plant, countour 12C1	62	-64.16	-67.07	∞
CB, spring-disk, none, 12C1	0	-65.53	- ∞	-62.59
Buy herbicides	5,719	-1.00	-1.29	-1.00
Buy diesel	1,892	-1.30	-1.32	-0.61
Buy LP gas	2,600	-0.69	-3.99	0.05
Borrow short-term capital	32,180	-0.075	-0.51	-0.07
Borrow medium term capital	25,299	-0.15	-0.15	-0.07
Buy nitrogen	15,596	-0.14	-0.26	0.01
Buy phopsphorous	9,948	-0.27	-2.70	0.02
Buy potash	11,072	-0.12	-2.04	0.01
Sell corn	15,596	2.56	2.01	3.39
Sell soybeans	5,124	7.30	6.28	18.63
Sell alfalfa hay	0	57.73	- ∞	65.48
Sell oats	0	1.56	-0.75	2.84
Sell pasture	0	8.00	- ∞	21.53

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