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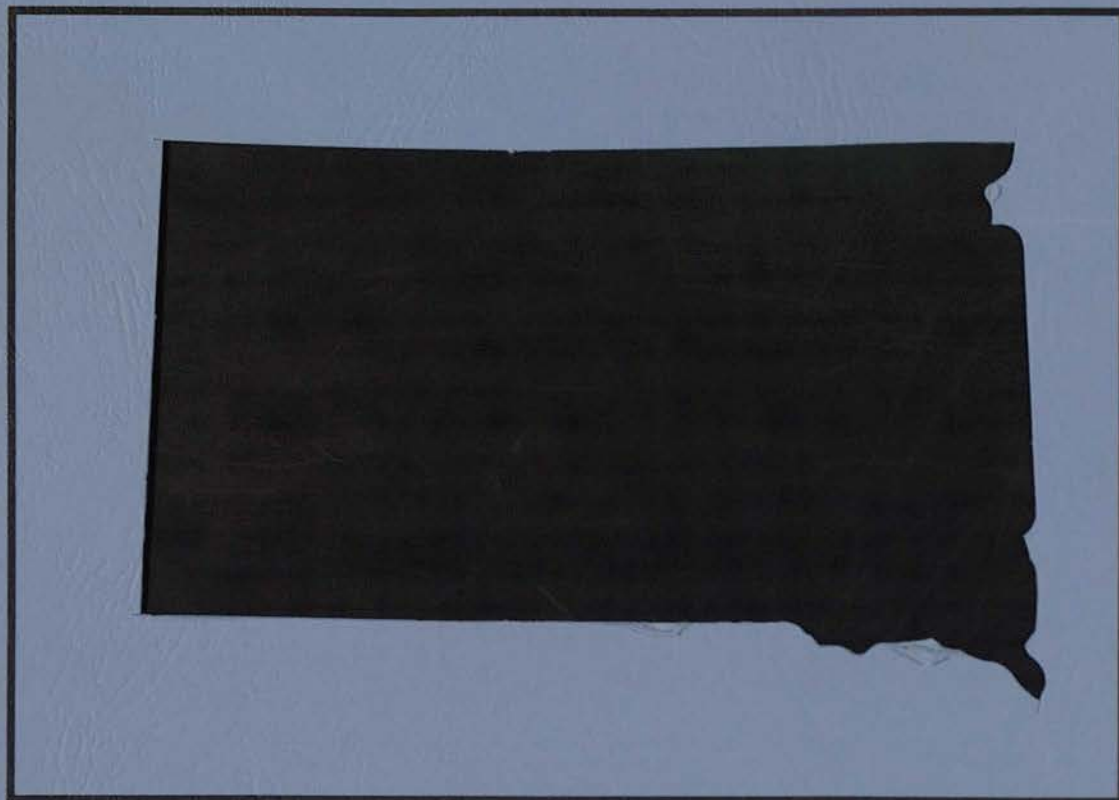
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CROP ENTERPRISE AND WHOLE-  
FARM BUDGETS FOR "CONVENTIONAL"  
FARMING SYSTEMS IN FIVE AREAS OF SOUTH DAKOTA

by

John D. Cole and Thomas L. Dobbs\*

Economics Research Report 90-3

July 1990

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## Preface

Crop enterprise and whole farm rotation budgets for "conventional" farms in five agroclimatic areas of South Dakota are included in this research report. The budgets for these conventional farms are being used for economic comparisons with "sustainable" farms in the same areas. Budgets for the sustainable farms are contained in South Dakota State University (SDSU) Economics Research Report 90-2, **Crop Enterprise and Principal Rotation Budgets for Sustainable Agriculture Case Farms in South Dakota**, May 1990.

The present report and Research Report 90-2 provide bases for several types of analysis now underway at SDSU and to be pursued further in the remainder of 1990 and in 1991. Those analyses include: (1) comparisons of net returns on "sustainable" and "conventional" farms in South Dakota; (2) estimations of the effects of changes in Federal farm programs and in other public programs and policies on the relative profitability of sustainable and conventional farming systems; and (3) assessments of the effects of conversions from conventional to sustainable systems on the strength of rural economies. Results of those analyses will be included in future reports. The program of research leading to the present research report and future reports from the analyses just mentioned is supported by the SDSU Agricultural Experiment Station and by Grant No. 88-56 from the Northwest Area Foundation (in St. Paul, MN).

A number of people provided valuable assistance in development of this report. Clarence Mends deserves appreciation for doing much of the work on the budgets for the East-Central South Dakota conventional farm; that farm also is being used in a companion study supported by the U.S. Department of Agriculture's "Low-Input/Sustainable Agriculture" research and education program. Mr. Mends and David Becker developed most of the machine costs used in the enterprise budgets of this report. Mr. Becker and Mr. Mends also critically reviewed the enterprise and whole farm budgets. Several individuals in the South Dakota Cooperative Extension Service provided substantial advice and assistance as we developed the budgets. They include: Burton Pflueger, Curtis Hoyt, Ralph Matz, Clint Clark, Alan May, Steve DeHoogh, and John Kangas. U.S. Soil Conservation Service personnel in South Dakota were helpful in identifying crops and cultural practices to include in the conventional farming systems. Those personnel include: Robert Rennolet, Doug Farrand, Nina Runner, Denis Bachman, and Jay Herrboldt. M.R. (Duke) Westerberg and Alan Vollers, of the U.S. Agricultural Stabilization and Conservation Service in South Dakota, also provided advice on crops and cultural practices. The following chemical suppliers and applicators were helpful in identifying local customary fertilizer and herbicide uses: Darrel Roth, Darrel Sombke, Richard Burnett, and John Edinger, Jr.

We thank Donald Taylor, especially, for his overall review of this manuscript. We also wish to thank Mrs. Verna Clark for her patience and care in typing the manuscript. Any remaining errors in this report are the responsibility of the authors.

JDC and TLD  
July 1990

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FARM BUDGETS FOR "CONVENTIONAL"  
FARMING SYSTEMS IN FIVE AREAS OF SOUTH DAKOTA

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**Introduction**

A mail survey of sustainable farms in South Dakota was conducted by the South Dakota State University (SDSU) Economics Department during 1988. Findings from that survey were reported by Taylor, et al., (1989). That effort was followed by on-farm personal interviews with 22 of the sustainable farmers during early 1989. Crop enterprise and principal rotations budgets for 12 case farms were developed from the information gained from the surveys and the personal interviews. Those budgets are available in Becker, et al. (1990).

The present report contains baseline economic information on conventional farming systems to be used in comparisons with the sustainable farming systems mentioned above. Farming systems characterized as "sustainable" are ones which generally use reduced --sometimes no-- synthetic fertilizers and pesticides, emphasize crop rotations which often include small grains and forage or green manure legumes, and use cover crop practices intended to protect the soil. Weeds are controlled primarily by cultivation, rotation effects, and hand weeding (sometimes in the case of crops like soybeans). The conventional farming systems in this study involve the use of both synthetic fertilizers and pesticides at "recommended" rates. Sometimes the moldboard plow is used.

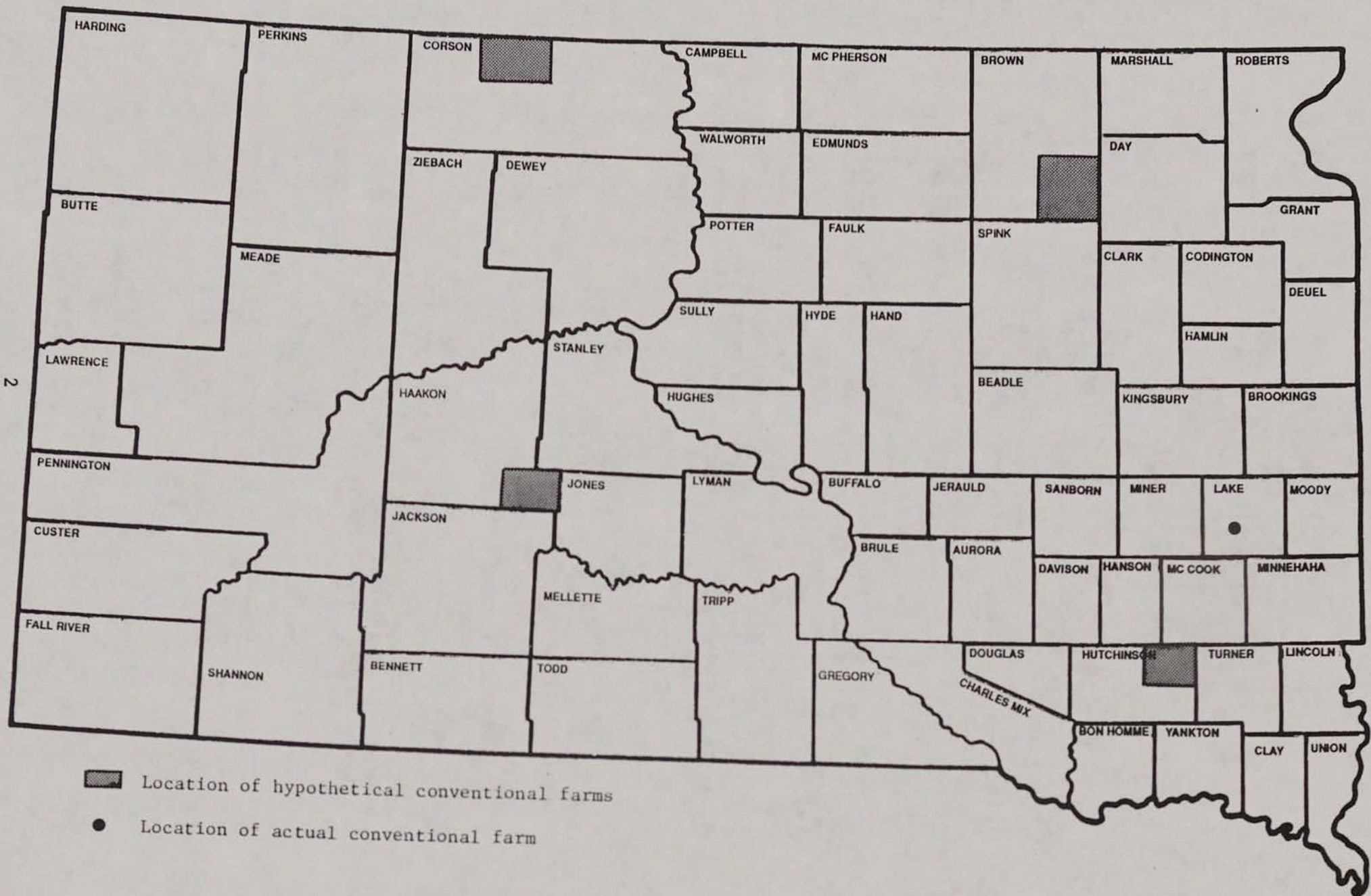
Four hypothetical and one actual conventional farm are presented in this research report. They are located in five different regions of the state where sustainable farms of similar size are being studied. These regions include the South Central (Hutchinson County), East Central (Lake County), Northeast (Brown County), Northwest (Corson County) and Southwest (Haakon County) regions. See Figure 1 for the location of each conventional farm.

This report contains estimates of costs and returns for various crop enterprises and rotations for typical conventional farming systems in different regions of the state. These budgets are being used in analyses evaluating the relative profitability of sustainable and conventional farming systems in South Dakota and in analyses of alternative farm policies. Results of those and other related analyses will be available in future publications.

**Procedures for Preparing Conventional Farm Budgets**

General procedures and assumptions used to construct budget spreadsheets for each conventional farm are presented and discussed in this section. Methods used to carry out whole-farm analyses are also discussed.

Figure 1. Location of the "conventional" farms in South Dakota.



## Methods Used to Identify Typical Rotations and Cultural Practices

The methodology to identify "typical" crop rotations and cultural practices for four of the five conventional farms included use of primary and secondary data sources. Actual farm data were used for the Lake County conventional farm. Thus, four of the farms are "synthetic" and one is actual.

Secondary sources relied upon most heavily included: 1) SDSU Cooperative Extension Service (CES) publication EMC-864 (Hoyt, et al., 1989), 2) the 1988 South Dakota Soil Conservation Cost-Return Handbook (Soil Conservation Service, 1988), 3) Budgets for Major Crop Enterprises in South Dakota (Allen, 1979), 4) South Dakota crop and livestock reports covering the years 1984 through 1988 (SDASS 1985-1989), and 5) the Fertilizer Recommendation Guide, EC-750 (Gerwing, et al., 1988). Numerous other publications and secondary sources were also drawn upon.

From these secondary sources, preliminary cultural practices, crop rotations, acreage distributions, and overall farm sizes for the four synthetic conventional farms were derived. Personal interviews were then conducted with "key informants" in the areas of the state represented by those four hypothetical conventional farms, to obtain more detailed information concerning conventional crop acreage distributions, crop rotations, and cultural practices. Key informants included Area Cooperative Extension Specialists, County Extension Agents, Soil Conservation Service personnel, and local agriculture chemical retailers and applicators.

From these two types of sources (secondary data and key informant interviews), semi-final, whole-farm, "synthetic" farms --with their assumed crop mixes, crop rotations, and cultural practices-- were determined.

Secondary data and key informants were also drawn on in determining the type of livestock one might expect to find in conjunction with conventional farms in each location. Effort was made to insure that each farm was proportionally balanced in terms of the acreage of forage crops and feed grains relative to the livestock enterprises associated with that farm.

Beef-cow/calf operations were assumed to be the type of livestock enterprise associated with each farm, except the actual conventional farm, where both a cattle and hog operation are known to exist. The number of head of beef cows was estimated by dividing the assumed pasture acres by typical grazing rates for the specific area. An 85 percent calf crop was assumed. Calves were assumed weaned in the fall and sold as feeders in the spring. The forage and feed requirements were then based on these estimated livestock numbers.

The semi-final versions of the four synthetic farms were then (again) compared to the previously mentioned secondary data and reviewed by SDSU Economics Department personnel, in an effort to eliminate any seemingly inaccurate or inappropriate data or assumptions. Final crop acreage distributions, crop rotations, and cultural practices were then settled on and are presented in this research report.

## Types of Costs

Costs in these budgets are grouped as fixed, direct (operating), and land costs. Fixed costs include depreciation, interest on capital, real estate taxes, machinery housing, and insurance on buildings and equipment. These costs are incurred whether or not a crop is grown. Direct costs include such things as fuel and lubrication, machinery repairs, fertilizer, herbicides, seed, and labor. When direct and fixed costs are both accounted for, income over all costs from the sale of the crop constitutes a return to land and management. When land ownership (opportunity) or rental costs are deducted, the result is "income over all costs"; this can be thought of as a return to management (Mends, et al., 1989).

## Machinery Assumptions

Machine costs for the crop budgets are itemized in Annex A. The machine costs were broken down into five categories: 1) fuel and lube; 2) machinery repairs; 3) labor; 4) taxes, housing, interest, and insurance; and 5) depreciation.

Machine costs for each crop are allocated to the crop according to the year the tillage practice is performed, i.e., on a calendar year basis. An example would be the seeding of winter wheat. The machine costs and seed necessary to plant winter wheat were charged to the summer fallow, since wheat is planted in the fall at the end of summer fallow period. Unless one understands the accounting practices being used here, this would appear to overestimate summer fallow costs and to underestimate winter wheat costs. Therefore, one must use caution when examining individual crop budgets. Generally, one should only draw "economic" conclusions from cost and returns associated with the system of which each crop enterprise is apart.

Machine costs for each crop were derived by first identifying the typical cultural practice for each crop in each of the different regions of the state (as explained previously), except in the East Central region, where farming system practices associated with an actual conventional farm were used. See Annex B, Tables 1-5, for the detailed list of cultural practices associated with each conventional farm.

It was assumed that a common implement of a given size was used for each field operation, so that estimated machine costs would reflect only differences in tillage operations. To estimate the cost for each tillage operation, costs for each implement were combined with the corresponding cost for the tractor used with that implement.

## Input Use and Price Assumptions

**Seeding Rates and Seed Prices.** Seeding rates were developed on the basis of the secondary sources and key informant interviews. Final seeding rates were verified in part by consulting SDSU CES Extension Extra-8020 (Hall, 1985). Seeding rates for the same crop sometimes vary by region, due to precipitation patterns, soil productivity, and so forth.

Assumed seed prices are listed in Annex C, Table C-1. Seed prices are average prices for 1988, based on list prices reported by six seed dealers in various regions of the state. These estimated prices were confirmed by Robert J. Pollman, Manager of the South Dakota Seed Certification Service (Becker, et al., 1990).

Prices paid for seed used as a nurse crop varied with how that nurse crop was harvested. If the nurse crop was baled for hay or chopped for silage, straight bin-run grain was assumed to be used for seed. The price assumed for bin grain used for seed is equal to the estimated market price plus \$0.25/bu. for cleaning.

**Fertilizer Rates and Prices.** Fertilizer rates were also based on secondary data and key informant interviews.

Fertilizer prices are listed in Annex C, Table C-2. These average prices for 1988 came from James R. Gerwing of the Plant Science Department (Becker, et al., 1990).

**Herbicide Rates and Prices.** Herbicide rates were based on secondary sources mentioned earlier and then adjusted on the basis of information received during the personal interviews--to reflect typical local application rates and methods of application.

Herbicide prices are shown in Annex C, Table C-3. These prices come from SDSU CES Extension Extra-8012 (Wrage and Johnson, 1988).

**Crop Insurance.** It was assumed that Federal Multiple Peril Crop Insurance (MPCI) was used by conventional farmers and, therefore, that all eligible crops in the conventional budgets were insured. The assumed level of coverage was 65 percent and the 1988 medium price election was used. The 1988 premium coefficients were obtained from CROP INSURE, a software package developed and copyrighted by the American Association of Crop Insurers. The formula used to calculate the cost of insurance is found in Becker, et al. (1990). The farm program base yield for program crops in that formula was obtained through phone calls to county ASCS offices in which the four synthetic conventional farms are located. For the actual conventional farm, the base yields were obtained from the farmer. The base yield in that formula for non-program crops was assumed to be equal to the estimated yield (Becker, et al., 1990).

**Storage.** Storage costs can be found in Annex C, Table C-4.

**Drying.** A drying cost of \$0.15/bu. was assumed for combined corn. No other crops were assumed to be dried.

**Overhead.** See Annex C, Table C-5 for overhead costs associated with different types of crops.

**Corn Shelling.** A cost of \$0.09/bu. was charged for corn shelling.

**Labor.** A labor rate of \$6.42/hr was charged for operating machinery and \$4.28/hr was charged for other labor, such as hand weeding soybeans and riding a bean bar.

**Interest.** The crop operating loan was assumed to be for 6 months at an annual rate of 12 percent. Interest was charged on all direct costs except for labor.

**Cropland Values.** Cropland values for each conventional farm were assumed to be the same as for sustainable farms in the same area. Those values, and the method of arriving at those values, are contained in Becker, et al. (1990). Cropland values of \$440/acre for the South Central, \$420/acre for the East Central, \$300/acre for Northeast, \$180/acre for the Northwest, and \$200/acre for the Southwest regions were assumed. These values represent estimates for the year 1988.

**Real Estate.** A land charge of 7 percent of cropland value and a real estate tax of 1.5 percent of cropland value were assumed in all of the budgets.

## **Yields**

Yields were estimated on the basis of information in secondary sources and the knowledge of the key informants. Secondary sources were used to estimate average yields for each synthetic conventional farm. These yields were further adjusted by key informants to reflect yields in the specific area where each synthetic farm is located. An effort was made to insure that estimated yields were in line with assumed fertilizer rates. Estimated yields were intended to represent "typical" or "normal" growing conditions. Estimated yields for a given crop can be found on the top line of the input section of the spreadsheet for each crop.

## **Whole-Farm Analysis and Output Price and Federal Farm Program Assumptions**

The enterprise budgets reported in this research report constitute a summary of inputs, costs, and returns for each synthetic conventional farm and for the one actual conventional farm. Each budget or spread sheet consists of three major parts: 1) an Input Section, 2) an Input Summary and Results sheet, and 3) a Whole-Farm Results page.

The Input section of the spreadsheet contains the estimated yield, price, and farm program payment information needed to calculate gross income per acre. Also listed here is information necessary for computing direct and fixed costs.

The Input Summary and Results section shows the return and costs per acre. Those are the summary figures of the Input Section described above. Places where ERR is observed should be disregarded. They simply reflect "errors" because of division of zero or by zero. Numbers in parentheses are negative.

The "Whole-Farm Results" section of the spreadsheet contains a table displaying crop distribution in acres and income over all costs on a per acre and per crop basis. Also listed is a table showing an overview of the results on a per acre basis. This table includes: 1) gross income, 2) direct costs excluding labor, 3) income over non-labor and non-land costs, 4) income over non-land costs and 5) income over all costs (except management costs). Also contained in this section is a table indicating farm program participation (Becker, et al., 1990).

Estimated crop selling prices are assumed in this report to be the same as those listed in EMC-864 (Hoyt., et al., 1989). These prices were expected 1988 local market prices; they vary with local demand and transportation costs. Those 1988 "expected" prices were intended to reflect prices that were expected to occur that year had normal growing conditions resulted, rather than the drought conditions that actually did occur (Becker, et al., 1990). Thus, both yields and prices in this report were intended to reflect a time of somewhat "normal" growing conditions.

The estimated per ton sale price of silage was determined by using the following formula:

$$\left( 4.00 \times \begin{array}{l} \text{price} \\ \text{of} \\ \text{corn/bu.} \end{array} \right) + \left( .15 \times \begin{array}{l} \text{price of} \\ \text{hay/ton} \end{array} \right) + \left( \$4.00, \text{ for storage} \right. \\ \left. \text{and shrinkage} \right)$$

The prices of other forage crops--such as oat hay, forage sorghum, and sudan grass hay--were estimated by examining the Total Digestible Nutrients (TDN) available in the forage in relation to alfalfa hay, so that a comparable price relationship based on TDN could be established. It was assumed that oat hay sells at 90 percent of the price of alfalfa hay. Forage sorghum rolled up as big round hay bales was assumed to sell at 72 percent of the price of alfalfa hay. These estimated selling prices were reviewed by Economics Department personnel in an effort to eliminate any seemly inaccurate or inappropriate prices. Phone calls also were made to key informants in areas of the state where these forage crops are assumed to be grown, as a further check for accuracy. It needs to be emphasized that there is not always an established market for "non-traditional" forage crops, such as oat hay and forage sorghum; therefore, estimating a value based on actual market information is difficult.

It was assumed that the synthetic farms participated in the Federal farm program at the minimum level for all eligible crops. The actual conventional farm (in Lake County) participated at higher than minimum levels. The output price is listed in two categories on the spreadsheet: 1) the estimated local selling price and 2) the 1988 deficiency payment for all eligible crops. The total income per acre results from the combination of selling price and deficiency payment for all eligible crops (Mends, et al., 1989).

The assumptions about the 1988 Federal farm program set-aside requirements and deficiency payments for program crops were as follows: 1) corn--20 percent non-paid acreage reduction and \$0.89/bu. deficiency payment; 2) wheat--27.5 percent non-paid reduction and \$0.50/bu. deficiency payment; 3) barley--20 percent non-paid reduction and \$0.53/bu. deficiency payment; 4)

oats --5 percent non-paid reduction and no deficiency payment; and 5) sorghum-20 percent non-paid reduction and \$0.90/bu. deficiency payment. See Tables 5 and 6 in Becker, et al. (1990) for additional information on optional, paid diversions. Alfalfa and soybeans are non-program crops; therefore, no acreage reduction requirements or deficiency payments apply to them.

The final part of the budget estimation process was to consider the results of the budgets on a whole-farm basis. The crop acreage calculations for the four synthetic farms were done in such a way that each farm was in compliance with the minimum requirements of the 1988 Federal farm program. In the case of the actual conventional farm in Lake County, the actual cropping pattern for 1988 was followed; that farm participated in the farm program above the minimum levels, participating in the paid diversion with 10 percent (48 acres) of its corn base acreage.

## Whole-Farm Budgets

This section contains the crop budgets developed for each region. Highlights of the crop rotations, cultural practices, and whole-farm budgets are discussed.

### Synthetic Conventional Farm for South Central Region (Hutchinson County)

The synthetic conventional farm in the South Central region (Hutchinson County) was assumed to be 450 acres in size, with 400 acres of cropland and 50 acres of pasture. The assumed Federal farm program base acres include 185 acres of corn and 64 acres of oats. In addition to corn and oats, soybeans and alfalfa are grown. The assumed actual crop acreage distribution, consistent with compliance at minimum participation levels in the Federal farm program, is shown below:

<u>Crop</u>	<u>Acres</u>	<u>"Normal" Harvested Yield</u>	<u>Farm Program Base Yield</u>
Corn	148	85 bu/ac.	61 bu/ac.
Soybeans	121	30 bu/ac.	--
Oats	61	75 bu/ac.	75 bu/ac.
Alfalfa	30	3.5 ton/ac.	--
Set-aside	<u>40</u>	--	--
Total	400		

The main crop rotation consists of oats-soybeans-corn. A small amount of alfalfa is included in the rotation. Alfalfa tends to follow small grain and precede corn. It was assumed that alfalfa is broken-up and reseeded every 3-4 years, or at a rate of 8 acres per year. Oats is assumed to be used as a nurse crop to establish alfalfa. The oats were assumed to be combined for grain. Set-aside acres tend to precede and to follow corn.

Soybeans is the only crop on this farm in which fertilizer was assumed not to be applied. The assumed method of application for fertilizer was broadcasting. Herbicides were assumed to be used on all crops except oats as a nurse crop for alfalfa and alfalfa.

Set-aside acres were assumed to be planted to forage sorghum. Forage sorghum could be grazed by livestock or cut for silage in the fall; however, no value for either of those possibilities was included in the gross returns. It was assumed in the budgets that the sorghum is chisel plowed before winter.

Cultural practices for this synthetic farm are shown in Annex Table B-1. The cultural practices are similar to those of the conventional farms in other regions, with the exception that the moldboard plow is assumed to be used more on this farm.

INPUT SECTION--SOUTH CENTRAL REGION

INPUT SECTION	Corn	Soybeans	Oats	Oats w/ Alfalfa	Alfalfa	Break Alfalfa	Set Aside
<b>RECEIPTS:</b>							
Estimated grain yield (units/ac.).....	85.0	30.0	75.0	75.0	3.5	3.5	0.0
Estimated selling price or value (\$/unit)..	\$1.94	\$6.50	\$1.80	\$1.80	\$50.00	\$50.00	\$0.00
<b>GOVERNMENT PAYMENT:</b>							
Base yield (units/ac.).....	61	30	75	75	0	0	0
Deficiency payment (\$/unit).....	\$0.89	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>DIRECT COSTS:</b>							
Seed 1 (units/ac.....	19	1	2.5	2.5	0	0	15
(\$/unit).....	\$0.80	\$11.05	\$4.48	\$4.48	\$0.00	\$0.00	\$0.30
Seed 2 (units/ac.....	0	0	0	11	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$1.95	\$0.00	\$0.00	\$0.00
Fertilizer 1 (units/ac.).....	10	0	40	30	0	0	0
(\$/unit).....	\$0.20	\$0.00	\$0.20	\$0.20	\$0.00	\$0.00	\$0.00
Fertilizer 2 (units/ac.).....	35	0	25	40	40	40	0
(\$/unit).....	\$0.19	\$0.00	\$0.19	\$0.19	\$0.19	\$0.19	\$0.00
Fertilizer 3 (units/ac.).....	20	0	10	30	0	0	0
(\$/unit).....	\$0.13	\$0.00	\$0.13	\$0.13	\$0.00	\$0.00	\$0.00
Fertilizer 4 (units/ac.).....	55	0	0	0	0	0	0
(Anhydous) (\$/unit).....	\$0.14	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 1 (units/ac.).....	7	1.25	0.5	0	0	0	1
(\$/unit).....	\$0.80	\$3.28	\$1.13	\$0.00	\$0.00	\$0.00	\$1.13
Herbicide 2 (units/ac.).....	0.5	0.05	0	0	0	0	0
(\$/unit).....	\$7.32	\$9.57	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 3 (units/ac.).....	0.25	0	0	0	0	0	0
(\$/unit).....	\$1.13	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (units/ac.).....	0	0	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$4.10	\$2.65	\$1.99	\$1.99	\$0.00	\$0.00	\$0.00
Storage (\$/unit).....	\$0.11	\$0.11	\$0.11	\$0.11	\$0.00	\$0.00	\$0.00
Drying (\$/unit).....	\$0.15	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.50	\$5.50	\$5.00	\$5.00	\$5.00	\$5.00	\$2.50
Custom machine hire.....							
Tillage (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Planting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Harvesting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$6.44	\$5.42	\$5.72	\$3.44	\$2.50	\$4.46	\$2.30
Machinery repair (\$/ac.).....	\$10.49	\$9.43	\$11.50	\$9.44	\$7.79	\$9.41	\$3.73
Crop operating loan borrowed (months).....	6	6	6	6	6	6	6
Interest APR(%).....	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Labor 1 (hrs./ac.).....	2.04	1.85	1.91	1.32	1.31	1.72	0.87
(\$/hr).....	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42
Labor 2 (hrs./ac.).....	0.00	0.60	0.00	0.00	0.00	0.00	0.00
(\$/hr.).....	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28
<b>FIXED COSTS:</b>							
Interest, Housing, and Ins. on Machinery...	\$18.71	\$17.27	\$17.80	\$14.02	\$11.70	\$14.82	\$5.52
Depreciation on machinery & equipment.....	\$19.98	\$19.03	\$19.33	\$16.00	\$13.93	\$16.54	\$5.62
Land Cost (\$/acre).....	\$440	\$440	\$440	\$440	\$440	\$440	\$440
Real Estate Tax Percentage.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50

----- (end of Input Section) -----

INPUT SUMMARY AND RESULTS--SOUTH CENTRAL REGION

	Corn	Soybeans	Oats	Oats w/ Alfalfa	Alfalfa	Break Alfalfa	Set Aside
<b>RECEIPTS:</b>							
Estimated grain yield (units/ac.).....	85.0	30.0	75.0	75.0	3.5	3.5	0.0
Estimated selling price or value (\$/unit)...	\$1.94	\$6.50	\$1.80	\$1.80	\$50.00	\$50.00	\$0.00
<b>GOVERNMENT PAYMENT:</b>							
Base yield (units/ac.).....	61	30	75	75	0	0	0
Deficiency payment (\$/unit).....	\$0.89	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
 I. Total income per acre.....	 \$219.19	 \$195.00	 \$135.00	 \$135.00	 \$175.00	 \$175.00	 \$0.00
<b>DIRECT COSTS:</b>							
Seed (\$/ac.).....	\$15.20	\$11.05	\$11.20	\$32.65	\$0.00	\$0.00	\$4.50
Fertilizer (\$/ac.).....	\$18.95	\$0.00	\$14.05	\$17.50	\$7.60	\$7.60	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide (\$/ac.).....	\$9.54	\$4.58	\$0.57	\$0.00	\$0.00	\$0.00	\$1.13
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$4.10	\$2.65	\$1.99	\$1.99	\$0.00	\$0.00	\$0.00
Storage (\$/ac.).....	\$9.35	\$3.30	\$8.25	\$8.25	\$0.00	\$0.00	\$0.00
Drying (\$/ac.).....	\$12.75	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.50	\$5.50	\$5.00	\$5.00	\$5.00	\$5.00	\$2.50
Custom machine hire (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$6.44	\$5.42	\$5.72	\$3.44	\$2.50	\$4.46	\$2.30
Machinery repair (\$/ac.).....	\$10.49	\$9.43	\$11.50	\$9.44	\$7.79	\$9.41	\$3.73
Interest on non labor direct costs (\$/ac)...	\$5.46	\$2.48	\$3.45	\$4.63	\$1.35	\$1.57	\$0.84
Labor charge(\$/ac.).....	\$13.10	\$14.45	\$12.26	\$8.47	\$8.41	\$11.04	\$5.59
 II. Total direct (operating) costs.....	 \$110.89	 \$58.86	 \$73.98	 \$91.38	 \$32.65	 \$39.08	 \$20.58
 Income over direct costs (I minus II)....	 \$108.30	 \$136.14	 \$61.02	 \$43.62	 \$142.35	 \$135.92	 (\$20.58)
 Breakeven price per unit (direct costs)..	 \$1.30	 \$1.96	 \$0.99	 \$1.22	 \$9.33	 \$11.17	 ERR
<b>FIXED COSTS:</b>							
Interest, Housing & Ins. on machinery (\$/ac)	\$18.71	\$17.27	\$17.80	\$14.02	\$11.70	\$14.82	\$5.52
Deprec. on machinery and equipment (\$/ac.)..	\$19.98	\$19.03	\$19.33	\$16.00	\$13.93	\$16.54	\$5.62
Real estate taxes (\$/ac.).....	\$6.60	\$6.60	\$6.60	\$6.60	\$6.60	\$6.60	\$6.60
 III. Total fixed costs.....	 \$45.29	 \$42.90	 \$43.73	 \$36.62	 \$32.23	 \$37.96	 \$17.74
 IV. Production costs (\$/ac., excluding land)	 \$156.18	 \$101.76	 \$117.71	 \$128.00	 \$64.88	 \$77.04	 \$38.32
(II plus III)							
Production costs (\$/unit).....	\$1.84	\$3.39	\$1.57	\$1.71	\$18.54	\$22.01	ERR
 V. Land charges (\$/ac.).....	 \$30.80	 \$30.80	 \$30.80	 \$30.80	 \$30.80	 \$30.80	 \$30.80
 VI. Total production and land costs (\$/ac.)	 \$186.98	 \$132.56	 \$148.51	 \$158.80	 \$95.68	 \$107.84	 \$69.12
(IV plus V)							
Production and land costs (\$/unit).....	\$2.20	\$4.42	\$1.98	\$2.12	\$27.34	\$30.81	ERR
Breakeven yield (units/ac.).....	96.4	20.4	82.5	88.2	1.9	2.2	ERR
(at selling price)							
 VII. Income over all costs (\$/acre).....	 \$32.21	 \$62.44	 (\$13.51)	 (\$23.80)	 \$79.32	 \$67.16	 (\$69.12)
(I minus VI)							
Income over all costs (\$/unit).....	\$0.38	\$2.08	(\$0.18)	(\$0.32)	\$22.66	\$19.19	ERR

WHOLE-FARM RESULTS--SOUTH CENTRAL REGION

Acreage Distribution and Income Over All Costs

	Corn	Soybeans	Oats	Oats w/ Alfalfa	Alfalfa	Break Alfalfa	Set Aside	Total
Crop Distribution (acres).....	148	121	53	8	22	8	40	400
Income Over All Costs..... (\$/acre)	\$32.21	\$62.44	(\$13.51)	(\$23.80)	\$79.32	\$67.16	(\$69.12)	\$27.33
Income Over All Costs..... (\$/crop)	\$4,768	\$7,556	(\$716)	(\$190)	\$1,745	\$537	(\$2,765)	\$10,934

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Item	Dollars/acre	Farm Program Provisions: Acreage Set-Aside Requirements		
		Non-Paid Acreage (%)	Optional Paid Acreage (%)	Rate (\$/bu)
Gross Income	\$174			
Direct costs (excl. labor)	\$63	Corn 20	***	***
Income over non-labor & non-land costs	\$77	Wheat ***	***	***
Income over non-land costs	\$65	Oats 5	***	***
Income over all costs	\$27	Barley ***	***	***
		Sorghum ***	***	***

**Actual Conventional Farm for  
East Central Region (Lake County)\***

The East-Central conventional farm is an actual operation with over 800 tillable acres. It's soils are typical of the area. It is a typical corn-soybean farm for the area. Corn and beans are rotated every-other-year on most fields, with the exception of Federal farm program set-aside acres. The livestock system for this case farm includes a beef cow-calf operation, in which the calves are fed out on a dry lot on the farm. There is also a hog finishing operation, from which approximately 1,000 hogs per year are marketed.

The crop distribution for this farm in 1988 included 336 acres of corn and 325 acres of soybeans; 144 acres went to farm program acreage reduction requirements, including participation in the optional paid diversion for corn. Participation in the Federal farm program by this farmer fluctuates between the minimum and maximum levels. The acreage distribution and assumed normal yields are shown below:

<u>Crop</u>	<u>Acres</u>	<u>"Normal" Harvested Yield</u>	<u>Farm Program Base Yield</u>
Corn	336	94	71
Soybeans	325	37	--
Set-aside	<u>144</u>	--	--
Total	805		

The "normal" harvested yield for each crop on this farm is the 1985-1989 5-year average (with the high and low years thrown out) of yield data reported by the farmer. The farm program base yield for corn was obtained from the farmer.

Millet is seeded on set-aside and is hayed in the fall.

This case farm uses many practices which are consistent with practices typically used by conventional farmers in the area. Commercial fertilizer (namely nitrogen, phosphorous, and potassium) and herbicides are used on the farm. Corn is cultivated at least once during the growing season. Soybeans have been drilled in narrow rows in recent years and, therefore, have not been cultivated. (Many local conventional farmers do not drill their soybeans.) No moldboard plow is used. A soil finisher, an all-in-one implement (combination disk, field cultivator, and harrow), is the principal implement for pre-plant preparation. Details of the cultural practices are shown in Annex Table B-2.

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\*This summary for the East-Central South Dakota actual conventional farm was prepared by Clarence Mends, Research Associate in the SDSU Economics Department.

INPUT SECTION--EAST CENTRAL REGION

INPUT SECTION	Corn	Soybean	Set Aside w/Millet	Paid Corn Set Aside
<b>RECEIPTS:</b>				
Estimated grain yield (units/ac.).....	94.0	37.0	2.0	2.0
Estimated selling price or value (\$/unit)..	\$1.90	\$6.50	\$25.00	\$25.00
<b>GOVERNMENT PAYMENT:</b>				
Base yield (units/ac.).....	71	37	0	71
Deficiency payment (\$/unit).....	\$0.89	\$0.00	\$0.00	\$1.75
<b>DIRECT COSTS:</b>				
Seed 1 (units/ac.).....	22.5	1.5	22.5	22.5
(\$/unit).....	\$0.80	\$11.05	\$0.16	\$0.16
Seed 2 (units/ac.).....	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00
Fertilizer 1 (units/ac.).....	74	9.2	0	0
(\$/unit).....	\$0.24	\$0.24	\$0.00	\$0.00
Fertilizer 2 (units/ac.).....	23.1	18.5	0	0
(\$/unit).....	\$0.20	\$0.20	\$0.00	\$0.00
Fertilizer 3 (units/ac.).....	7.7	6.2	0	0
(\$/unit).....	\$0.13	\$0.13	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 1 (units/ac.).....	4.75	1	0	0
(\$/unit).....	\$2.63	\$6.55	\$0.00	\$0.00
Herbicide 2 (units/ac.).....	0.5	3	0	0
(\$/unit).....	\$7.32	\$6.84	\$0.00	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (units/ac.).....	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$3.39	\$2.89	\$0.00	\$0.00
Storage (\$/unit).....	\$0.11	\$0.11	\$0.00	\$0.00
Drying (\$/unit).....	\$0.15	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.50	\$5.50	\$2.50	\$2.50
Custom machine hire.....				
Tillage (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Planting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Harvesting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$3.70	\$2.50	\$2.82	\$2.82
Machinery repair (\$/ac.).....	\$8.12	\$7.13	\$6.60	\$6.60
Crop operating loan borrowed (months).....	6	6	6	6
Interest APR(%).....	12.00	12.00	12.00	12.00
Labor 1 (hrs./ac.).....	1.25	0.85	1.50	1.50
(\$/hr).....	\$6.42	\$6.42	\$6.42	\$6.42
Labor 2 (hrs./ac.).....	0.00	0.00	0.00	0.00
(\$/hr.).....	\$4.28	\$4.28	\$4.28	\$4.28
<b>FIXED COSTS:</b>				
Interest, Housing, and Ins. on Machinery...	15.85	11.86	9.82	9.82
Depreciation on machinery & equipment.....	\$18.06	\$14.58	\$11.35	\$11.35
Land Cost (\$/acre).....	\$420	\$420	\$420	\$420
Real Estate Tax Percentage.....	1.50	1.50	1.50	1.50

------(end of Input Section)-----

INPUT SUMMARY AND RESULTS--EAST CENTRAL REGION

			Paid Corn	
	Corn	Soybean	Set Aside	Set Aside
RECEIPTS:	+-----+			
Estimated grain yield (units/ac.).....	94.0	37.0	2.0	2.0
Estimated selling price or value (\$/unit)...	\$1.90	\$6.50	\$25.00	\$25.00
GOVERNMENT PAYMENT:				
Base yield (units/ac.).....	71	37	0	71
Deficiency payment (\$/unit).....	\$0.89	\$0.00	\$0.00	\$1.75
I. Total income per acre.....	\$241.79	\$240.50	\$50.00	\$174.25
DIRECT COSTS:				
Seed (\$/ac.).....	\$18.00	\$16.58	\$3.60	\$3.60
Fertilizer (\$/ac.).....	\$23.38	\$6.71	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide (\$/ac.).....	\$16.15	\$27.07	\$0.00	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$3.39	\$2.89	\$0.00	\$0.00
Storage (\$/ac.).....	\$10.43	\$4.11	\$0.00	\$0.00
Drying (\$/ac.).....	\$14.10	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.50	\$5.50	\$2.50	\$2.50
Custom machine hire (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$3.70	\$2.50	\$2.82	\$2.82
Machinery repair (\$/ac.).....	\$8.12	\$7.13	\$6.60	\$6.60
Interest on non labor direct costs (\$/ac)...	\$6.08	\$4.29	\$0.92	\$0.92
Labor charge(\$/ac.).....	\$8.03	\$5.46	\$9.63	\$9.63
II. Total direct (operating) costs.....	\$116.89	\$82.23	\$26.07	\$26.07
Income over direct costs (I minus II)....	\$124.90	\$158.27	\$23.93	\$148.18
Break-even price per unit (direct costs)..	\$1.24	\$2.22	\$13.03	\$13.03
FIXED COSTS:				
Interest, Housing & Ins. on machinery (\$/ac)	\$15.85	\$11.86	\$9.82	\$9.82
Deprec. on machinery and equipment (\$/ac.)..	\$18.06	\$14.58	\$11.35	\$11.35
Real estate taxes (\$/ac.).....	\$6.30	\$6.30	\$6.30	\$6.30
III. Total fixed costs.....	\$40.21	\$32.74	\$27.47	\$27.47
IV. Production costs (\$/ac., excluding land)	\$157.10	\$114.97	\$53.54	\$53.54
(II plus III)				
Production costs (\$/unit).....	\$1.67	\$3.11	\$26.77	\$26.77
V. Land charges (\$/ac.).....	\$29.40	\$29.40	\$29.40	\$29.40
VI. Total production and land costs (\$/ac.)	\$186.50	\$144.37	\$82.94	\$82.94
(IV plus V)				
Production and land costs (\$/unit).....	\$1.98	\$3.90	\$41.47	\$41.47
Break-even yield (units/ac.).....	98.2	22.2	3.3	3.3
(at selling price)				
VII. Income over all costs (\$/acre).....	\$55.29	\$96.13	(\$32.94)	\$91.31
(I minus VI)				
Income over all costs (\$/unit).....	\$0.59	\$2.60	(\$16.47)	\$45.66

WHOLE-FARM RESULTS--EAST CENTRAL REGION

Acreage Distribution and Income over All Costs.

	Paid Corn				Total
	Corn	Soybean	Set Aside	Set Aside	
Crop Distribution (acres)..	336	325	96	48	805
Income Over All Costs..... (\$/acre)	\$55.29	\$96.13	(\$32.94)	\$91.31	\$63.41
Income Over All Costs..... (\$/crop)	\$18,579	\$31,243	(\$3,162)	\$4,383	\$51,042

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Item	Dollars/acre	Farm Program Provisions: Acreage Set-Aside Requirements		
		Crop	Non-Paid	Optional Paid
			Acreage	Acreage
		(%)	(%)	(\$/bu)
Gross Income	\$214			
Direct cost (excl.labor)	\$79			
Income over non-labor & non-land costs	\$106	Corn	20.0	10.0 1.75
		Wheat	***	*** ***
		Oats	***	*** ***
Income over non-land costs	\$99	Barley	***	*** ***
		Sorghum	***	*** ***
Income over all costs	\$63			

**Synthetic Conventional Farm for  
Northeast Region (Brown County)**

The synthetic conventional farm in the Northeast region (Brown County) was assumed to be 1000 acres in size with 750 acres of cropland and 250 acres of pasture. The Federal farm program base acres were assumed to be 375 acres of spring wheat, 125 acres of corn, and 125 acres of barley. In addition to these crops, soybeans and alfalfa are also grown. The assumed actual crop acreage distribution, consistent with compliance at minimum set-aside levels for program crops, is shown below:

<u>Crop</u>	<u>Acres</u>	<u>"Normal" Harvested Yield</u>	<u>Farm Program Base Yield</u>
Corn	100	55 bu/ac.	50 bu/ac.
Spring Wheat	272	26 bu/ac.	25 bu/ac.
Soybeans	75	25 bu/ac.	--
Barley	87	40 bu/ac.	40 bu/ac.
Barley for Silage	13	5 ton/ac.	40 bu/ac.
Alfalfa	50	2 ton/ac.	--
Summer Fallow	<u>153</u>	--	--
Total	750		

The main crop rotation consists of small grain-soybeans-corn-summer fallow/set-aside. Alfalfa follows a small grain and tends to precede set-aside acres. Alfalfa is assumed to be broken up every 4 years. Barley is used as a nurse crop to establish alfalfa. The barley is assumed to be chopped for silage before the grain matures in an effort to conserve moisture for the new alfalfa. Set-aside is maintained as part of the normal summer fallow process.

Synthetic chemical fertilizer is assumed to be used on all cropland except alfalfa and summer fallow/set-aside acres. Herbicide is assumed to be applied to all cropland except alfalfa.

Cultural practices are similar to those of conventional farms in other regions. The moldboard plow is assumed not to be used except to break up alfalfa ground and as part of the pony press. The pony press is a plow, drill, and packer pulled in tandem. It was assumed that a pony press is used in this region to seed summer fallow/set-aside acres. Summer fallow/set-aside is chisel plowed with sweeps three times during the spring and summer and then sprayed with a herbicide. Following spraying, strips of flax covering approximately 10 percent of the field are assumed to be planted on the summer fallow/set-aside acreage in the fall to prevent erosion.

INPUT SECTION--NORTHEAST REGION

INPUT SECTION	Spring			Barley	Continue	Break	Set Aside	
	Corn	Wheat	Soybeans	w/Alfalpa	Alfalpa	Alfalpa	/ Fallow	
<b>RECEIPTS:</b>								
Estimated grain yield (units/ac.).....	55.0	26.0	25.0	40.0	5.0	2.0	2.0	0.0
Estimated selling price or value (\$/unit)..	\$1.89	\$3.75	\$6.50	\$1.90	\$19.06	\$50.00	\$50.00	\$0.00
<b>GOVERNMENT PAYMENT:</b>								
Base yield (units/ac.).....	50	25	25	40	40	0	0	0
Deficiency payment (\$/unit).....	\$0.89	\$0.50	\$0.00	\$0.53	\$0.53	\$0.00	\$0.00	\$0.00
<b>DIRECT COSTS:</b>								
Seed 1 (units/ac.).....	14	1.25	1	1.5	1.5	0	0	4
(\$/unit).....	\$0.80	\$6.55	\$11.05	\$4.80	\$2.15	\$0.00	\$0.00	\$0.17
Seed 2 (units/ac.).....	0	0	0	0	8	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$1.95	\$0.00	\$0.00	\$0.00
Fertilizer 1 (units/ac.).....	65	35	5	35	35	0	0	0
(\$/unit).....	\$0.20	\$0.20	\$0.20	\$0.20	\$0.20	\$0.00	\$0.00	\$0.00
Fertilizer 2 (units/ac.).....	30	15	20	15	15	0	0	0
(\$/unit).....	\$0.19	\$0.19	\$0.19	\$0.19	\$0.19	\$0.00	\$0.00	\$0.00
Fertilizer 3 (units/ac.).....	0	0	0	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 1 (units/ac.).....	5	0.5	1.5	1	1	0	0	40
(\$/unit).....	\$2.63	\$10.15	\$3.28	\$2.17	\$5.13	\$0.00	\$0.00	\$0.16
Herbicide 2 (units/ac.).....	0	0	0	0	0	0	0	10
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.07
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (units/ac.).....	0	0	0	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$4.92	\$2.05	\$2.67	\$2.41	\$2.41	\$0.00	\$0.00	\$0.00
Storage (\$/unit).....	\$0.11	\$0.11	\$0.11	\$0.11	\$4.00	\$0.00	\$0.00	\$0.00
Drying (\$/unit).....	\$0.15	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.50	\$5.00	\$5.50	\$5.00	\$5.00	\$5.00	\$5.00	\$2.50
Custom machine hire.....								
Tillage (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Planting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Harvesting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$5.13	\$3.94	\$4.89	\$4.21	\$5.08	\$1.49	\$3.45	\$3.87
Machinery repair (\$/ac.).....	\$9.24	\$9.45	\$8.81	\$9.85	\$11.53	\$4.87	\$6.49	\$2.69
Crop operating loan borrowed (months).....	6	6	6	6	6	6	6	6
Interest APR(%).....	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Labor 1 (hrs./ac.).....	1.69	1.32	1.58	1.44	1.70	0.95	1.36	0.74
(\$/hr).....	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42
Labor 2 (hrs./ac.).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(\$/hr.).....	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28
<b>FIXED COSTS:</b>								
Interest, Housing, and Ins. on Machinery...	\$17.46	\$14.80	\$17.07	\$15.53	\$12.78	\$7.12	\$10.24	\$5.41
Depreciation on machinery & equipment.....	\$18.95	\$16.60	\$18.58	\$17.31	\$13.27	\$8.37	\$10.98	\$4.70
Land Cost (\$/acre).....	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300
Real Estate Tax Percentage.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

------(end of Input Section)-----

INPUT SUMMARY AND RESULTS--NORTHEAST REGION

	Spring			Barley Continue		Break	Set Aside	
	Corn	Wheat	Soybeans	Barley	w/Alfalfa	Alfalfa	Alfalfa /	Fallow
RECEIPTS:								
Estimated grain yield (units/ac.).....	55.0	26.0	25.0	40.0	5.0	2.0	2.0	0.0
Estimated selling price or value (\$/unit)...	\$1.89	\$3.75	\$6.50	\$1.90	\$19.06	\$50.00	\$50.00	\$0.00
GOVERNMENT PAYMENT:								
Base yield (units/ac.).....	50	25	25	40	40	0	0	0
Deficiency payment (\$/unit).....	\$0.89	\$0.50	\$0.00	\$0.53	\$0.53	\$0.00	\$0.00	\$0.00
I. Total income per acre.....	\$148.45	\$110.00	\$162.50	\$97.20	\$116.50	\$100.00	\$100.00	\$0.00
DIRECT COSTS:								
Seed (\$/ac.).....	\$11.20	\$8.19	\$11.05	\$7.20	\$18.83	\$0.00	\$0.00	\$0.66
Fertilizer (\$/ac.).....	\$18.70	\$9.85	\$4.80	\$9.85	\$9.85	\$0.00	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide (\$/ac.).....	\$13.15	\$5.08	\$4.92	\$2.17	\$5.13	\$0.00	\$0.00	\$7.18
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$4.92	\$2.05	\$2.67	\$2.41	\$2.41	\$0.00	\$0.00	\$0.00
Storage (\$/ac.).....	\$6.05	\$2.86	\$2.75	\$4.40	\$20.00	\$0.00	\$0.00	\$0.00
Drying (\$/ac.).....	\$8.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.50	\$5.00	\$5.50	\$5.00	\$5.00	\$5.00	\$5.00	\$2.50
Custom machine hire (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$5.13	\$3.94	\$4.89	\$4.21	\$5.08	\$1.49	\$3.45	\$3.87
Machinery repair (\$/ac.).....	\$9.24	\$9.45	\$8.81	\$9.85	\$11.53	\$4.87	\$6.49	\$2.69
Interest on non labor direct costs (\$/ac)...	\$4.86	\$2.75	\$2.69	\$2.67	\$4.61	\$0.67	\$0.88	\$1.00
Labor charge(\$/ac.).....	\$10.86	\$8.47	\$10.14	\$9.24	\$10.91	\$6.10	\$8.73	\$4.75
II. Total direct (operating) costs.....	\$97.87	\$57.63	\$58.21	\$57.00	\$93.34	\$18.13	\$24.56	\$22.65
Income over direct costs (I minus II)....	\$50.58	\$52.37	\$104.29	\$40.20	\$23.16	\$81.87	\$75.44	(\$22.65)
Breakeven price per unit (direct costs)..	\$1.78	\$2.22	\$2.33	\$1.42	\$18.67	\$9.07	\$12.28	ERR
FIXED COSTS:								
Interest, Housing & Ins. on machinery (\$/ac)	\$17.46	\$14.80	\$17.07	\$15.53	\$12.78	\$7.12	\$10.24	\$5.41
Deprec. on machinery and equipment (\$/ac.)..	\$18.95	\$16.60	\$18.58	\$17.31	\$13.27	\$8.37	\$10.98	\$4.70
Real estate taxes (\$/ac.).....	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50
III. Total fixed costs.....	\$40.91	\$35.90	\$40.15	\$37.34	\$30.55	\$19.99	\$25.72	\$14.61
IV. Production costs (\$/ac., excluding land)	\$138.78	\$93.53	\$98.36	\$94.34	\$123.89	\$38.12	\$50.28	\$37.26
(II plus III)								
Production costs (\$/unit).....	\$2.52	\$3.60	\$3.93	\$2.36	\$24.78	\$19.06	\$25.14	ERR
V. Land charges (\$/ac.).....	\$21.00	\$21.00	\$21.00	\$21.00	\$21.00	\$21.00	\$21.00	\$21.00
VI. Total production and land costs (\$/ac.)	\$159.78	\$114.53	\$119.36	\$115.34	\$144.89	\$59.12	\$71.28	\$58.26
(IV plus V)								
Production and land costs (\$/unit)....	\$2.91	\$4.41	\$4.77	\$2.88	\$28.98	\$29.56	\$35.64	ERR
Breakeven yield (units/ac.).....	84.5	30.5	18.4	60.7	7.6	1.2	1.4	ERR
(at selling price)								
VII. Income over all costs (\$/acre).....	(\$11.33)	(\$4.53)	\$43.14	(\$18.14)	(\$28.39)	\$40.88	\$28.72	(\$58.26)
(I minus IV)								
Income over all costs (\$/unit).....	(\$0.21)	(\$0.17)	\$1.73	(\$0.45)	(\$5.68)	\$20.44	\$14.36	ERR

WHOLE-FARM RESULTS--NORTHEAST REGION

Acreage Distribution and Income Over All Costs

	Corn	Spring Wheat	Soybeans	Barley	Barley w/Alfalfa	Continue Alfalfa	Break Alfalfa	Set Aside / Fallow	Total
Crop Distribution (acres)..	100	272	75	87	13	37	13	153	750
Income Over All Costs..... (\$/acre)	(\$11.33)	(\$4.53)	\$43.14	(\$18.14)	(\$28.39)	\$40.88	\$28.72	(\$58.26)	(\$10.81)
Income Over All Costs..... (\$/crop)	(\$1,133)	(\$1,232)	\$3,235	(\$1,578)	(\$369)	\$1,513	\$373	(\$8,914)	(\$8,105)

\*\*\*\*\*

Item	Dollars/acre	Farm Program Provisions Acreage Set-Aside Requirements			
		Non-Paid		Optional Paid	
		Acreage	Acreage	Rate	
Gross Income	\$96				
Direct costs (excl. labor)	\$46	Crop	(%)	(%)	(\$/bu)
Income over non-labor & non-land costs	\$23	Corn	20	***	***
		Wheat	27.5	***	***
		Oats	***	***	***
Inc. over non-land costs	\$15	Barley	20	***	***
		Sorghum	***	***	***
Inc. over all costs	(\$11)				

**Synthetic Conventional Farm for Southwest Region (Haakon County)**

The synthetic conventional farm located in the Southwest region (Haakon County) was assumed to be 3,500 acres in size, with 2,500 acres of cropland and 1,000 acres of pasture. This is not typical of this region. A typical farm in this region would be about two-thirds pasture and one-third cropland. However, the synthetic conventional farm chosen for this region was designed to have a crop and pasture resource base similar to that of the case sustainable farm in Haakon County. This was done so comparisons of the two types of farms could be made. The crop distribution, crop rotations, and cultural practices are typical of a conventional farm in this area.

The Federal farm program base acres were assumed to include 1,175 acres of winter wheat, 565 acres of grain sorghum, and 174 acres of oats. In addition to these crops, forage sorghum is raised. The assumed crop distribution, taking into account set-aside requirements (at minimum farm program set-aside levels) and fallow requirements for 1988, are shown in the table below:

<u>Crop</u>	<u>Acres</u>	<u>"Normal" Harvested Yield</u>	<u>Farm Program Base Yields</u>
Winter wheat	852	35 bu/ac.	27 bu/ac.
Grain sorghum	452	40 bu/ac.	31 bu/ac.
Forage sorghum	50	3 ton/ac.	--
Oats (grain)	134	50 bu/ac.	50 bu/ac.
Oats (hayed)	31	2.5 ton/ac.	50 bu/ac.
Alfalfa	125	1.5 ton/ac.	--
Summer fallow	<u>856</u>	--	--
Total	2,500		

The main crop rotations consist of: 1) summer fallow/set-aside-winter wheat-grain or forage sorghum; 2) summer fallow/set-aside-winter wheat; and 3) summer fallow/set-aside-winter wheat-oats-grain or forage sorghum or alfalfa.

Alfalfa is assumed to be broken up every 4 years. Oats is used as a nurse crop to establish alfalfa. The oats are swathed and round-baled before reaching maturity. Baled oats were estimated to yield 2.5 tons per acre.

Set-aside acres are maintained as part of the summer fallow. Summer fallow is assumed to be chisel plowed four times, fertilized, and seeded to winter wheat.

Synthetic chemical fertilizer is assumed to be applied to oats and to summer fallow used to establish winter wheat. Herbicides are assumed to be used on all crops except oats as a nurse crop, alfalfa, and summer fallow.

Cultural practices do not include any use of the moldboard plow. See Annex Table B-4 for details of the cultural practices.

INPUT SECTION--SOUTHWEST REGION

INPUT SECTION	Winter Wheat	Grain Sorghum	Forage Sorghum	Oats/ Grain	Oats/ Nurse	Alfalfa Continues	Alfalfa/ Breaking	Sum Fal w/W.Wht
<b>RECEIPTS:</b>								
Estimated grain yield (units/ac.).....	35.0	40.0	3.0	50.0	2.5	1.5	1.5	0.0
Estimated selling price or value (\$/unit)..	\$3.60	\$1.80	\$36.00	\$1.80	\$45.00	\$50.00	\$50.00	\$0.00
<b>GOVERNMENT PAYMENT:</b>								
Base yield (units/ac.).....	27	31	0	50	50	0	0	0
Deficiency payment (\$/unit).....	\$0.50	\$0.90	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>DIRECT COSTS:</b>								
Seed 1 (units/ac.).....	0	4	10	2	1.5	0	0	1.25
(\$/unit).....	\$0.00	\$0.66	\$0.30	\$4.48	\$2.05	\$0.00	\$0.00	\$7.00
Seed 2 (units/ac.).....	0	0	0	0	8	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$1.95	\$0.00	\$0.00	\$0.00
Fertilizer 1 (units/ac.).....	0	0	0	35	15	0	0	40
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.20	\$0.20	\$0.00	\$0.00	\$0.20
Fertilizer 2 (units/ac.).....	0	0	0	15	20	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.19	\$0.19	\$0.00	\$0.00	\$0.00
Fertilizer 3 (units/ac.).....	0	0	0	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 1 (units/ac.).....	1	1	1	1	0	0	0	0
(\$/unit).....	\$1.13	\$1.13	\$1.13	\$1.69	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 2 (units/ac.).....	0	0	0	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (units/ac.).....	0	0	0	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$3.00	\$1.60	\$0.00	\$1.33	\$1.33	\$0.00	\$0.00	\$0.00
Storage (\$/unit).....	\$0.11	\$0.11	\$0.00	\$0.11	\$0.00	\$0.00	\$0.00	\$0.00
Drying (\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.00	\$5.50	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$2.50
Custom machine hire.....								
Tillage (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Planting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Harvesting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$2.30	\$3.05	\$3.63	\$3.64	\$2.76	\$1.09	\$2.29	\$5.79
Machinery repair (\$/ac.).....	\$4.58	\$7.11	\$7.21	\$7.63	\$6.68	\$3.00	\$3.73	\$5.33
Crop operating loan borrowed (months).....	6	6	6	6	6	6	6	6
Interest APR(%).....	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Labor 1 (hrs./ac.).....	0.55	0.96	1.58	1.18	1.47	0.78	1.00	1.31
(\$/hr).....	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42
Labor 2 (hrs./ac.).....	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(\$/hr.).....	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28
<b>FIXED COSTS:</b>								
Interest, Housing, and Ins. on Machinery...	\$8.55	\$11.28	\$10.15	\$12.70	\$9.59	\$4.36	\$5.87	\$8.71
Depreciation on machinery & equipment.....	\$10.02	\$13.31	\$12.26	\$14.44	\$11.51	\$5.31	\$6.57	\$7.97
Land Cost (\$/acre).....	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200
Real Estate Tax Percentage.....	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

------(end of Input Section)-----

INPUT SUMMARY AND RESULTS--SOUTHWEST REGION

	Winter Wheat	Grain Sorghum	Forage Sorghum	Oats/ Grain	Oats/ Nurse	Alfalpa Continues	Alfalpa Breaking	Sum Fal w/W.Wht
<b>RECEIPTS:</b>								
Estimated grain yield (units/ac.).....	35.0	40.0	3.0	50.0	2.5	1.5	1.5	0.0
Estimated selling price or value (\$/unit)...	\$3.60	\$1.80	\$36.00	\$1.80	\$45.00	\$50.00	\$50.00	\$0.00
<b>GOVERNMENT PAYMENT:</b>								
Base yield (units/ac.).....	27	31	0	50	50	0	0	0
Deficiency payment (\$/unit).....	\$0.50	\$0.90	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
I. Total income per acre.....	\$139.50	\$99.90	\$108.00	\$90.00	\$112.50	\$75.00	\$75.00	\$0.00
<b>DIRECT COSTS:</b>								
Seed (\$/ac.).....	\$0.00	\$2.64	\$3.00	\$8.96	\$18.68	\$0.00	\$0.00	\$8.75
Fertilizer (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$9.85	\$6.80	\$0.00	\$0.00	\$8.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide (\$/ac.).....	\$1.13	\$1.13	\$1.13	\$1.69	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$3.00	\$1.60	\$0.00	\$1.33	\$1.33	\$0.00	\$0.00	\$0.00
Storage (\$/ac.).....	\$3.85	\$4.40	\$0.00	\$5.50	\$0.00	\$0.00	\$0.00	\$0.00
Drying (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.00	\$5.50	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$2.50
Custom machine hire (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$2.30	\$3.05	\$3.63	\$3.64	\$2.76	\$1.09	\$2.29	\$5.79
Machinery repair (\$/ac.).....	\$4.58	\$7.11	\$7.21	\$7.63	\$6.68	\$3.00	\$3.73	\$5.33
Interest on non labor direct costs (\$/ac)...	\$1.18	\$1.51	\$1.18	\$2.58	\$2.44	\$0.54	\$0.65	\$1.80
Labor charge(\$/ac.).....	\$3.53	\$6.16	\$10.14	\$7.58	\$9.44	\$5.01	\$6.42	\$8.41
II. Total direct (operating) costs.....	\$24.57	\$33.10	\$31.30	\$53.75	\$53.12	\$14.64	\$18.09	\$40.58
Income over direct costs (I minus II)....	\$114.93	\$66.80	\$76.70	\$36.25	\$59.38	\$60.36	\$56.91	(\$40.58)
Breakeven price per unit (direct costs)..	\$0.70	\$0.83	\$10.43	\$1.08	\$21.25	\$9.76	\$12.06	ERR
<b>FIXED COSTS:</b>								
Interest, Housing & Ins. on machinery (\$/ac)	\$8.55	\$11.28	\$10.15	\$12.70	\$9.59	\$4.36	\$5.87	\$8.71
Deprec. on machinery and equipment (\$/ac.)..	\$10.02	\$13.31	\$12.26	\$14.44	\$11.51	\$5.31	\$6.57	\$7.97
Real estate taxes (\$/ac.).....	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
III. Total fixed costs.....	\$21.57	\$27.59	\$25.41	\$30.14	\$24.10	\$12.67	\$15.44	\$19.68
IV. Production costs (\$/ac., excluding land) (II plus III)	\$46.14	\$60.69	\$56.71	\$83.89	\$77.22	\$27.31	\$33.53	\$60.26
Production costs (\$/unit).....	\$1.32	\$1.52	\$18.90	\$1.68	\$30.89	\$18.20	\$22.35	ERR
V. Land charges (\$/ac.).....	\$14.00	\$14.00	\$14.00	\$14.00	\$14.00	\$14.00	\$14.00	\$14.00
VI. Total production and land costs (\$/ac.) (IV plus V)	\$60.14	\$74.69	\$70.71	\$97.89	\$91.22	\$41.31	\$47.53	\$74.26
Production and land costs (\$/unit).....	\$1.72	\$1.87	\$23.57	\$1.96	\$36.49	\$27.54	\$31.69	ERR
Breakeven yield (units/ac.)..... (at selling price)	16.7	41.5	2.0	54.4	2.0	0.8	1.0	ERR
VII. Income over all costs (\$/acre)..... (I minus VI)	\$79.36	\$25.21	\$37.29	(\$7.89)	\$21.28	\$33.69	\$27.47	(\$74.26)
Income over all costs (\$/unit).....	\$2.27	\$0.63	\$12.43	(\$0.16)	\$8.51	\$22.46	\$18.31	ERR

WHOLE-FARM RESULTS--SOUTHWEST REGION

Acreage Distribution and Income Over All Costs

	Winter Wheat	Grain Sorghum	Forage Sorghum	Oats/ Grain	Oats/ Nurse	Alfalfa Continues	Alfalfa/ Breaking	Sum Fal w/W.Wht	Total
Crop Distribution (acres).....	852	452	50	134	31	94	31	856	2500
Income Over All Costs..... (\$/acre)	\$79.36	\$25.21	\$37.29	(\$7.89)	\$21.28	\$33.69	\$27.47	(\$74.26)	\$8.37
Income Over All Costs..... (\$/crop)	\$67,617	\$11,395	\$1,865	(\$1,057)	\$660	\$3,167	\$852	(\$63,564)	\$20,933

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Item	Dollars/acre	Farm Program Provisions: Acreage Set-Aside Requirements		
		Non-Paid Acreage	Optional Acreage	Paid Rate
Gross Income	\$78			
Direct costs (excl. labor)	\$27			
Income over non-labor & non-land costs	\$32			
Income over non-land costs	\$25			
Income over all costs	\$8			
		Crop	(%)	(\$/bu)
		Corn	***	***
		Wheat	27.5	***
		Oats	5	***
		Barley	***	***
		Sorghum	10	***

**Synthetic Conventional Farm for  
Northwest Region (Corson County)**

The synthetic typical farm in the Northwest region (Corson County) was assumed to be 3,000 total acres, with 790 acres of cropland and 2,210 acres of pasture. The Federal farm program base acres were assumed to include 100 acres of corn, 255 acres of spring wheat, and 75 acres of barley. In addition to these crops, alfalfa is raised. The assumed crop distribution, taking into account set-aside requirements (at minimum farm program set-aside levels) and fallow requirements for 1988 are shown in the table below:

<u>Crop</u>	<u>Acres</u>	<u>"Normal" Harvested Yield</u>	<u>Farm Program Base Yields</u>
Spring wheat	185	20 bu/ac.	18 bu/ac.
Corn (grain)	59	45 bu/ac.	30 bu/ac.
Corn (silage)	21	6.7 ton/ac.	30 bu/ac.
Barley	60	40 bu/ac.	29 bu/ac.
Summer fallow	<u>290</u>	--	--
Total	615		

The main crop rotation consists of summer fallow/set-aside-small grain-corn or back to summer fallow. Alfalfa is not included in this analysis since it is seldom broken up; it may remain for approximately 12 years, continuously. If alfalfa is broken up, oats are used as nurse crop to reestablish the alfalfa. Set-aside acres are maintained as part of the summer fallow.

Summer fallow was assumed to be chisel plowed with sweeps three times, with no fertilizer and pesticides applied or cover crops grown. If it is a dry year, fallow acres may be planted to sudan grass that would be harvested as a forage crop. Corn is assumed to be grown for feed. Therefore, all acres of corn were assumed to be picked on the ear or cut for silage, instead of combined and sold as grain.

Synthetic chemical fertilizer and herbicides are assumed to be used on all crops included in the budgets.

Cultural practices on this farm do not include any use of the moldboard plow. No post-harvest tillage practices are assumed to be performed on any of the crops. This is typical of the area; it represents an effort by farmers to prevent soil erosion.

INPUT SECTION--NORTHWEST REGION

INPUT SECTION	Spring	Corn	Corn	Summer	
	Wheat	Picked	Silage	Barley	Fallow
<b>RECEIPTS:</b>					
Estimated grain yield (units/ac.).....	20.0	45.0	6.7	40.0	0.0
Estimated selling price or value (\$/unit)..	\$3.75	\$1.95	\$19.30	\$1.90	\$0.00
<b>GOVERNMENT PAYMENT:</b>					
Base yield (units/ac.).....	18	30	30	29	0
Deficiency payment (\$/unit).....	\$0.50	\$0.89	\$0.89	\$0.53	\$0.00
<b>DIRECT COSTS:</b>					
Seed 1 (units/ac.....	1.25	10	10	1.25	0
(\$/unit).....	\$6.55	\$0.80	\$0.80	\$4.80	\$0.00
Seed 2 (units/ac.....	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fertilizer 1 (units/ac.).....	23	36	36	23	0
(\$/unit).....	\$0.20	\$0.20	\$0.20	\$0.20	\$0.00
Fertilizer 2 (units/ac.).....	10	16	16	10	0
(\$/unit).....	\$0.19	\$0.19	\$0.19	\$0.19	\$0.00
Fertilizer 3 (units/ac.).....	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide 1 (units/ac.).....	1	0.5	0.5	1	0
(\$/unit).....	\$1.53	\$7.32	\$7.32	\$1.53	\$0.00
Herbicide 2 (units/ac.).....	0	0.25	0.25	0	0
(\$/unit).....	\$0.00	\$1.13	\$1.13	\$0.00	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (units/ac.).....	0	0	0	0	0
(\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$1.87	\$2.90	\$3.66	\$1.84	\$0.00
Storage (\$/unit).....	\$0.11	\$0.13	\$4.00	\$0.11	\$0.00
Drying (\$/unit).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.00	\$5.50	\$5.50	\$5.00	\$2.50
Custom machine hire.....					
Tillage (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Planting (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Harvesting (\$/ac.).....	\$0.00	\$4.05	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$3.59	\$5.30	\$6.68	\$3.74	\$4.56
Machinery repair (\$/ac.).....	\$8.57	\$7.69	\$12.28	\$8.85	\$2.92
Crop operating loan borrowed (months).....	6	6	6	6	6
Interest APR(%).....	12.00	12.00	12.00	12.00	12.00
Labor 1 (hrs./ac.).....	1.05	2.06	2.04	1.13	0.86
(\$/hr).....	\$6.42	\$6.42	\$6.42	\$6.42	\$6.42
Labor 2 (hrs./ac.).....	0.00	0.00	0.00	0.00	0.00
(\$/hr.).....	\$4.28	\$4.28	\$4.28	\$4.28	\$4.28
<b>FIXED COSTS:</b>					
Interest, Housing, and Ins. on Machinery...	\$13.06	\$15.27	\$16.69	\$13.31	\$6.04
Depreciation on machinery & equipment.....	\$15.08	\$14.34	\$15.98	\$15.33	\$5.04
Land Cost (\$/acre).....	\$180	\$180	\$180	\$180	\$180
Real Estate Tax Percentage.....	1.50	1.50	1.50	1.50	1.50

------(end of Input Section)-----

INPUT SUMMARY AND RESULTS--NORTHWEST REGION

	Spring Wheat	Corn Picked	Corn Silage	Barley	Summer Fallow
<b>RECEIPTS:</b>					
Estimated grain yield (units/ac.).....	20.0	45.0	6.7	40.0	0.0
Estimated selling price or value (\$/unit)...	\$3.75	\$1.95	\$19.30	\$1.90	\$0.00
<b>GOVERNMENT PAYMENT:</b>					
Base yield (units/ac.).....	18	30	30	29	0
Deficiency payment (\$/unit).....	\$0.50	\$0.89	\$0.89	\$0.53	\$0.00
I. Total income per acre.....	\$84.00	\$114.45	\$156.01	\$91.37	\$0.00
<b>DIRECT COSTS:</b>					
Seed (\$/ac.).....	\$8.19	\$8.00	\$8.00	\$6.00	\$0.00
Fertilizer (\$/ac.).....	\$6.50	\$10.24	\$10.24	\$6.50	\$0.00
Fertilizer application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Herbicide (\$/ac.).....	\$1.53	\$3.94	\$3.94	\$1.53	\$0.00
Herbicide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Insecticide application (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Crop insurance (\$/ac.).....	\$1.87	\$2.90	\$3.66	\$1.84	\$0.00
Storage (\$/ac.).....	\$2.20	\$5.85	\$26.80	\$4.40	\$0.00
Drying (\$/ac.).....	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Overhead (\$/ac.).....	\$5.00	\$5.50	\$5.50	\$5.00	\$2.50
Custom machine hire (\$/ac.).....	\$0.00	\$4.05	\$0.00	\$0.00	\$0.00
Fuel and lubrication (\$/ac.).....	\$3.59	\$5.30	\$6.68	\$3.74	\$4.56
Machinery repair (\$/ac.).....	\$8.57	\$7.69	\$12.28	\$8.85	\$2.92
Interest on non labor direct costs (\$/ac.)...	\$2.22	\$3.16	\$4.56	\$2.24	\$0.59
Labor charge(\$/ac.).....	\$6.74	\$13.20	\$13.10	\$7.23	\$5.52
II. Total direct (operating) costs.....	\$46.40	\$69.83	\$94.76	\$47.33	\$16.09
Income over direct costs (I minus II)....	\$37.60	\$44.62	\$61.25	\$44.04	(\$16.09)
Breakeven price per unit (direct costs)..	\$2.32	\$1.55	\$14.14	\$1.18	ERR
<b>FIXED COSTS:</b>					
Interest, Housing & Ins. on machinery (\$/ac)	\$13.06	\$15.27	\$16.69	\$13.31	\$6.04
Deprec. on machinery and equipment (\$/ac.)..	\$15.08	\$14.34	\$15.98	\$15.33	\$5.04
Real estate taxes (\$/ac.).....	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70
III. Total fixed costs.....	\$30.84	\$32.31	\$35.37	\$31.34	\$13.78
IV. Production costs (\$/ac., excluding land) (II plus III)	\$77.24	\$102.14	\$130.13	\$78.67	\$29.87
Production costs (\$/unit).....	\$3.86	\$2.27	\$19.42	\$1.97	ERR
V. Land charges (\$/ac.).....	\$12.60	\$12.60	\$12.60	\$12.60	\$12.60
VI. Total production and land costs (\$/ac.) (IV plus V)	\$89.84	\$114.74	\$142.73	\$91.27	\$42.47
Production and land costs (\$/unit).....	\$4.49	\$2.55	\$21.30	\$2.28	ERR
Breakeven yield (units/ac.)..... (at selling price)	24.0	58.8	7.4	48.0	ERR
VII. Income over all costs (\$/acre)..... (I minus VI)	(\$5.84)	(\$0.29)	\$13.28	\$0.10	(\$42.47)
Income over all costs (\$/unit).....	(\$0.29)	(\$0.01)	\$1.98	\$0.00	ERR

WHOLE-FARM RESULTS--NORTHWEST REGION

Acreage Distribution and Income Over All Costs

	Spring Wheat	Corn Picked	Corn Silage	Barley	Summer Fallow	Total
Crop Distribution (acres).....	185	59	21	60	290	615
Income Over All Costs..... (\$/acre)	(\$5.84)	(\$0.29)	\$13.28	\$0.10	(\$42.47)	(\$21.35)
Income Over All Costs..... (\$/crop)	(\$1,081)	(\$17)	\$279	\$6	(\$12,317)	(\$13,130)

\*\*\*\*\*

Item	Dollars/acre	Farm Program Provisions: Acreage Set-Aside Requirements			
		Non-Paid Acreage	Optional Acreage	Paid Rate	
		Crop	(%)	(%)	(\$/bu)
Gross Income	\$50				
Direct costs (excl. labor)	\$29				
Income over non-labor & non-land costs	\$1	Corn	20	***	***
		Wheat	27.5	***	***
		Oats	***	***	***
		Barley	20	***	***
		Sorghum	***	***	***
Income over non-land costs	(\$6)				
Income over all costs	(\$21)				

## Whole-Farm Analysis Summary

Whole-farm analysis results for each conventional farm are summarized in Table 1.

On a per acre basis, the East Central farm had the highest direct costs other than labor. This can be partially attributed to more intensive fertilizer and pesticide usage than in other study areas.

Gross income per acre was calculated using estimated crop yields and market prices, together with Federal price supports for all program crops. Gross income per acre varied substantially -- from \$214 per acre in the East Central area to \$50 per acre in the Northwest region.

All farms had positive net income "over all costs except land, labor and management". When labor was included in the costs, all farms except the Northwest farm had positive net income.

If the synthetic and actual conventional farms are evaluated on a "net income over all costs except management" basis, only three of the farms appear profitable -- the East Central, the Southwest, and the South Central farms.

Livestock were not directly accounted for in these net income calculations. All harvested crops (including hay and silage) included in the analysis were assigned economic values, whether fed to livestock or marketed. Use of pasture or range was not included in the analysis. In some cases (where noted), somewhat permanent alfalfa was not included in the analyses.

The cost and return calculations included in this report are being used in comparative analyses with so-called "sustainable" farms in on-going studies at South Dakota State University. Hence, more attention to **interpretation** will be given to the information contained in the present report when other reports are prepared based on those comparative analyses.

Table 1. Summary Results of Synthetic and Actual Conventional Farming Systems

Conventional Farms, by Region	Direct Costs Other Than Labor	Gross Income	\$/Acre		
			All Costs Except Land, Labor, and Management	All Costs Except Land and Management	All Costs Except Management
-----Net Income Over-----					
South Central (Hutchinson County)*	63	174	77	65	27
East Central (Lake County)**	79	214	106	99	63
Northeast (Brown County)*	46	96	23	15	-11
Southwest (Haakon County)*	27	78	32	25	8
Northwest (Corson County)*	29	50	1	- 6	-21

\*Synthetic conventional farms

\*\*An actual conventional farm

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## Annex A

### Machine Costs

Machine costs used in the crop enterprise budgets are shown in Annex Table A-1. The costs are intended to be current as of 1988. An explanation of sources and calculation procedures is found in Annex 1 of Becker, et al. (1990). Brief explanations of additional machine items follow.

**Small Grain Forage Harvester:** To obtain machinery costs for the small grain forage harvester, figures were taken directly from Dobbs, et al. (1987). These costs were then adjusted for inflation. This resulted in a cost of \$14.36 per acre. This was compared to custom rates reported by Thaden (1987) of \$12.75-\$18.00 across the state. It was decided that no further adjustment was needed in the per acre cost of \$14.36.

**Anhydrous Applicator:** To obtain machinery costs for the anhydrous applicator, figures were taken directly from Dobbs, et al. (1987). These costs were then adjusted for inflation. This resulted in a cost of \$4.96 per acre. This was compared to custom rates reported by Thaden (1987) of \$1.00 - \$10.00 per acre across the state. No further adjustment was made to the per acre cost of \$4.96.

**Skid Sprayer or Pickup Sprayer:** The machine costs for the skid sprayer were arrived at by the following method. Detailed working tables used for Research Report 88-3 (Taylor, et al., 1988) were obtained. The pickup was assumed to be a 3/4 ton size and the sprayer to be 40 foot. The costs listed in the working tables were adjusted for inflation. The total cost per acre decided on was \$0.84/acre.

Annex Table A-1.

## Machine Costs Used In Crop Budgets (1988)

Assumed Acres/Yr for Mach. Use	Machine Operation	Direct (Operating) Costs			Fixed Costs**			
		Fuel & Lube	Machinery Repair	Labor*	Mach. Int., Hou. & In	Deprec.	Total \$/Acre	
					\$/acre			
731	Fall Plow 5/16"	1.96	1.62	2.63		3.12	2.61	11.94
599	Chisel 15'	0.96	0.73	1.29		1.51	1.26	5.75
	Sweep	0.24		0.13				0.37
599	Chisel w/Sweep 15'	1.20	0.73	1.42		1.51	1.26	6.12
500	Noble Blade 15'	0.91	0.74	1.31		1.59	1.95	6.50
1000	Soil Finisher 24'	0.64	0.68	0.63		1.73	2.16	5.84
820	Tandem Disk 17'	0.44	0.54	0.94		1.42	1.36	4.70
740	Offset Disk 17'	1.05	0.87	1.04		2.28	2.18	7.42
917	Rotary Hoe 20'	0.23	0.26	0.83		0.55	0.50	2.37
	Field Cult. and Drill 10'	1.04	2.60	2.39		2.20	2.80	11.03
800	Field Cultivator 17'	0.66	0.58	1.29		0.70	0.77	4.00
	Spike Harrow 24'	0.06	0.35			0.13	0.14	0.68
	Field Cult. w/Harrow	0.72	0.93	1.29		0.83	0.91	4.68
1075	Spike Harrow 24'	0.42	0.65	0.71		0.65	0.51	2.94
330	Pony Press 8'	2.28	3.88	3.02		4.88	5.11	19.17
330	Ordinary Press Drill 10'	0.62	2.09	2.33		1.99	2.34	9.37
	Packer	0.06	0.22			0.29	0.31	0.88
330	Drill w/Packer	0.68	2.31	2.33		2.28	2.65	10.25
330	No Till or Hoe Press Drill	0.83	2.21	2.33		2.12	2.39	9.88
371	Row Planter 6 row 30"	0.44	1.35	1.24		3.27	3.35	9.65
371	R. T. Row Planter 6 x 30"	0.93	2.00	1.24		4.71	4.71	13.59
525	Cultivator Conv. 6 x 30"	0.53	0.49	1.47		0.95	0.82	4.26
525	R. T. Cultivator 6 row 30"	1.09	1.19	1.47		2.36	2.11	8.22
740	Sprayer 8 row 26'	0.28	0.37	1.05		0.60	0.66	2.96
1636	Pickup/Skid Sprayer	0.08	0.07	0.24		0.21	0.24	0.84
2046	Spray Coupe	0.04	0.11	0.19		0.39	0.41	1.14



## Annex B

### Cultural Practices

Assumed (and actual for the Lake County farm) cultural practices are summarized for each conventional farm in Tables B-1 through B-5. The left hand columns indicate the type of cultural practiced performed. The number of times that cultural practice is performed is indicated for each crop within the body of the table.

Annex Table B-1. Cultural Practices for South Central System Crops

Cultural Practice	-----Number of times the cultural practice is performed-----						
	Corn	Soybeans	Oats	Oats as nurse crop	Alfalfa continuous	Alfalfa breaking	Set-aside
<u>Pre-plant land preparation</u>							
Field cultivate w/drag	1	1	1	1			
Tandem disk	1	1	1	1			1
<u>Fertilizer application</u>							
Broadcast spreader			1	1	1		
Anhydrous applicator	1						
<u>Planting</u>							
Press drill			1	1			1
Planter	1	1					
<u>Weed control</u>							
Cultivate	2	2					
Spray herbicide (pull type)	1	1	1				1
Bean bar		1					
<u>Harvest</u>							
Swath			1	1	3	3	
Round bale					3	3	
Combine	1	1	1	1			
Gravity box	1	1	1	1			
Stack hand					3	3	
<u>Post-Harvest</u>							
Chisel plow w/points	1	1					1
Moldboard plow			1			1	

Annex Table B-2. Cultural Practices for East Central System Crops

Cultural Practice	Number of times cultural practice is performed*		
	Corn	Soybeans	Set-aside
<u>Pre-plant land preparation</u>			
Soil finisher	1	1	
Disk			2
<u>Planting</u>			
Press drill		1	1
Planter	1		
<u>Weed control</u>			
Row cultivate	1		
Spray herbicide (spray coupe)	1	1	
<u>Harvest</u>			
Combine	1	1	
Swather			1
Round baler			1
Gravity box	1	1	
<u>Post harvest</u>			
Tandem disk	1		

\*Fertilizer and herbicides are applied twice to corn during the growing season, once with the soil finisher and once with the spray coupe. Fertilizer is applied to soybeans twice, once with the drill and once with the spray coupe. Herbicides are applied to soybeans with the soil finisher and again with the spray coupe.

Annex Table B-3. Cultural Practices for Northeast System Crops

Cultural Practice	-----Number of times the cultural practice is performed-----							
	Spring Corn	wheat	Soybeans	Barley	Barley as nurse crop	Alfalfa continuous	Alfalfa breaking	Set-aside summer fallow
<u>Pre-plant land preparation</u>								
Field cultivate w/drag	1	1	1	1	1			
Tandem disk	1	1	1	1	1			
Chisel plow w/sweeps								3
<u>Fertilizer application</u>								
Broadcast spreader	1		1	1	1			
<u>Planting</u>								
Press drill		1		1	1			
Planter	1		1					
Pony press								1
Drag					1			
<u>Weed control</u>								
Cultivate	2		2					
Spray herbicide (spray coupe)	1	1	1	1	1			1
<u>Harvest</u>								
Swath		1		1	1	2	2	
Round bale						2	2	
Combine	1	1	1	1				
Silage chop					1			
Stack hand						2	2	
Silage wagon					1			
Gravity box	1	1	1	1				
<u>Post-Harvest</u>								
Chisel plow w/points	1	1	1	1				
Moldboard plow							1	

Annex Table B-4. Cultural Practices for Southwest System Crops

Cultural Practice	-----Number of times the cultural practice is performed-----							
	Winter wheat	Grain Sorghum	Forage Sorghum	Oats for grain	Oats as nurse crop	Alfalfa continuous	Alfalfa breaking	Set-aside summer fallow
<u>Pre-plant land preparation</u>								
Chisel plow w/sweeps		1	1					4
Tandem disk				1	1			
<u>Fertilizer application</u>								
Broadcast spreader				1	1			1
<u>Planting</u>								
Press drill		1	1	1	1			
Hoe drill								1
<u>Weed control</u>								
Spray herbicide (spray coupe)	1	1	1	1				
<u>Harvest</u>								
Swath			1		1	1	1	
Round bale			1		1	1	1	
Stacking			1		1	1	1	
Combine	1	1		1				
Gravity box	1	1		1				
<u>Post-harvest</u>								
Chisel plow w/sweeps	1			1				1

Annex Table B-5. Cultural Practices for Northwest System Crops

Cultural Practice	-----Number of times the cultural practice is performed--				
	Spring wheat	Corn picked	Corn silage	Barley	Summer fallow
<u>Pre-plant land preparation</u>					
Chisel plow w/points		1	1		1
Chisel plow w/sweeps	1			1	3
Tandem disc		1	1		
<u>Fertilizer application</u>					
Broadcast spreader	1	1	1	1	
<u>Planting</u>					
Planter		1	1		
Field cultivator with press drill behind	1			1	
<u>Weed control</u>					
Cultivate		2	2		
Spray herbicide (skid sprayer)	1	1	1	1	
<u>Harvest</u>					
Ear corn picker		1			
Chop silage			1		
Swath	1			1	
Combine	1			1	
Silage wagon			1		
Gravity box	1	1		1	
<u>Post-harvest</u>					
None					

## Annex C

### Non-Machinery Crop Production Costs

This annex contains tables listing input costs assumed in the crop enterprise budgets. Table C-1 lists the seed prices used. Table C-2 lists fertilizer costs used, and Table C-3 lists the herbicide prices used. Storage and overhead costs are listed in Tables C-4 and C-5, respectively.

Annex Table C-1. Estimated South Dakota Seed  
Prices for 1988

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<u>Commodity</u>	<u>Price Per Unit</u>
Corn	\$ 0.80/1,000 kernels
Oats	\$ 4.48/bu.
Spring Wheat	\$ 6.55/bu.
Soybeans	\$11.05/bu.
Rye	\$ 4.80/bu.
Flax	\$ 9.25/bu.
Barley	\$ 4.80/bu.
Winter Wheat	\$ 7.00/bu.
Forage Sudan	\$ 0.30/lb.
Alfalfa	\$ 1.95/bu.

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Annex Table C-2. Estimated South Dakota  
Prices for Fertilizers

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<u>Fertilizer</u>	<u>Price</u>
Nitrogen, dry	\$0.20/lb.
Nitrogen, liquid	\$0.24/lb.
Phosphorus, dry	\$0.19/lb.
Phosphorus, liquid	\$0.20/lb.
Potassium, dry or liquid	\$0.13/lb.
Anhydrous ammonia	\$0.14/lb.

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Annex Table C-3. Herbicide Prices Used in the Budgets\*

<u>Herbicide</u>	<u>Price/unit</u>
2,4-D 3.8L (Amine)	\$ 1.13/pt.
2,4-D 3.8E (Ester)	\$ 1.53/pt.
MCPA 4L	\$ 1.69/pt.
Banvel 4L	\$ 7.32/pt.
Eradicane 6.7E	\$ 2.63/pt.
Harmony	\$10.15/oz.
Treflan 4E	\$ 3.28/pt.
Bucktril 2L	\$ 5.13/pt.
Fallow Master	\$20.74/gal.
Roundup 3L	\$76.55/gal.
Lasso II 15G	\$ .80/lb.

\*Assumed 1988 prices were taken from Wrage and Johnson (1988).

Annex Table C-4. Estimated Storage Costs

<u>Crop</u>	<u>Storage Cost Per Unit</u>
Corn Silage	\$4.00/ton
Picked Corn	\$0.13/bu.
Sunflowers	\$0.003/lb.
All other grains	\$0.11/bu.

Annex Table C-5. Estimated Overhead Costs

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<u>Type of Crop</u>	<u>Cost per Acre</u>
Row Crops	\$5.50
Small Grains & Alfalfa	\$5.00
Summer Fallow & Set-aside	\$2.50

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