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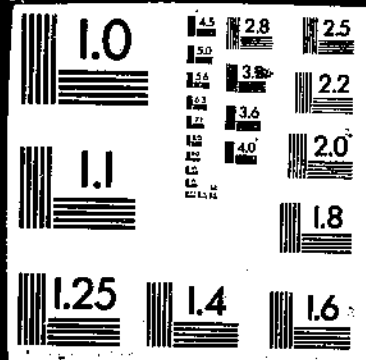
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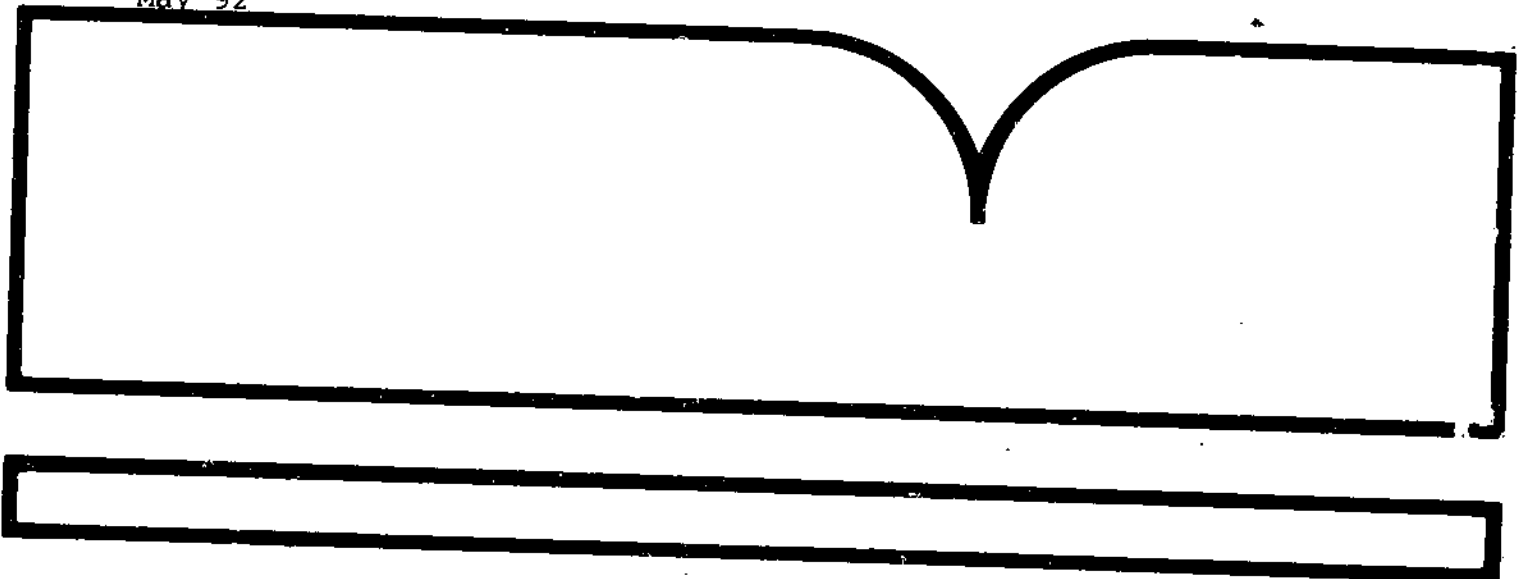


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State-Level Costs of Production: Major Field Crops, 1987-89

(U.S.) Economic Research Service, Washington, DC

May 92



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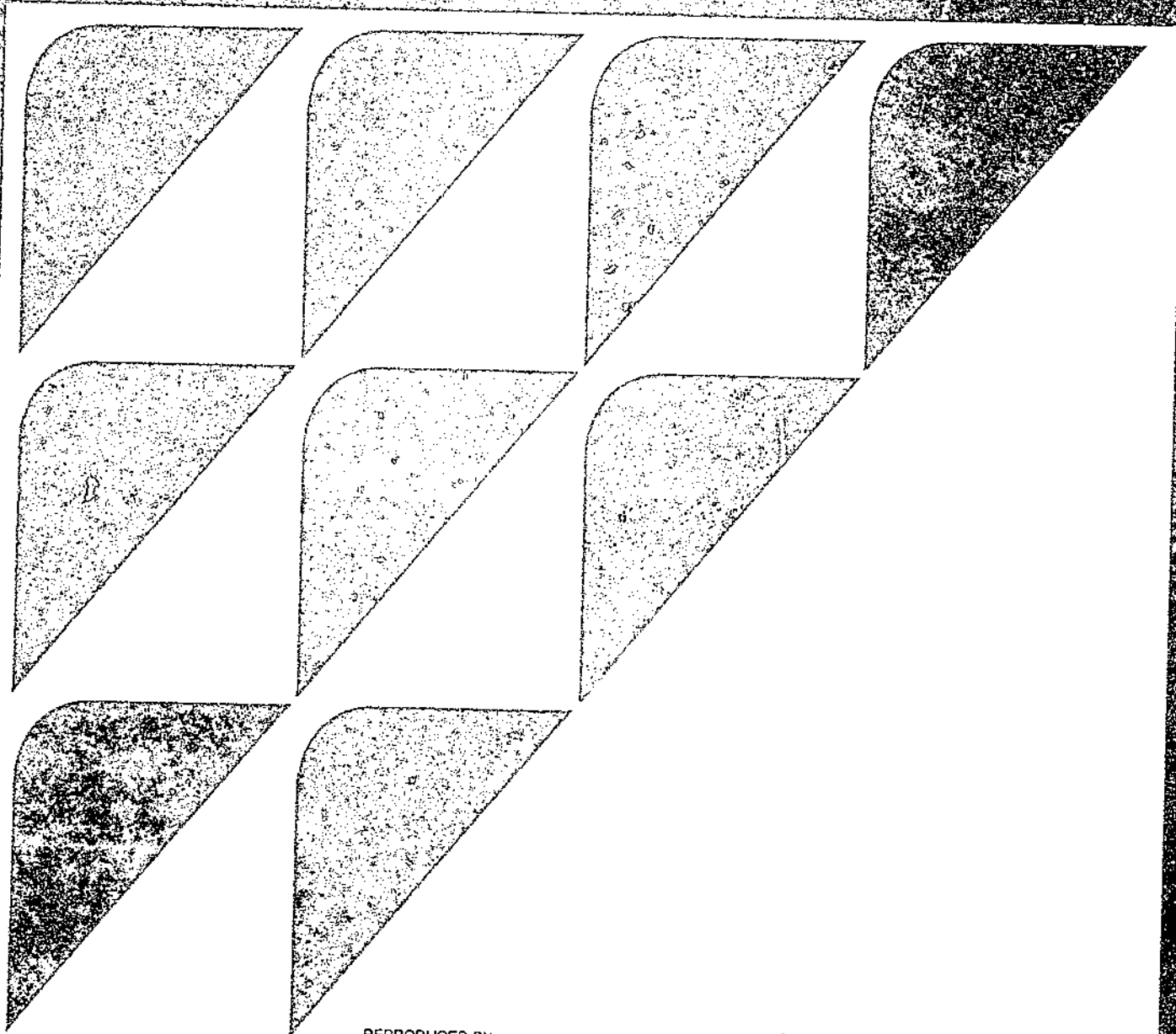
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Economic  
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Statistical  
Bulletin  
Number 888

# State-Level Costs of Production: Major Field Crops, 1987-89

Mr. B. Ali



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**State-Level Costs of Production: Major Field Crops, 1987-89.** By Mir B. Ali. Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. Statistical Bulletin Number 838.

#### Abstract

Costs of producing major U.S. crops increased slightly in 1989 as a result of an increase in input prices paid by farmers. The largest increase was in seed prices, reflecting the drought in 1988. State-level production costs and returns for 1987-89 presented in this report are consistent with regional and U.S. weighted averages published in the Economic Indicators of the Farm Sector: Costs of Production--Major Field Crops, 1989. However, State-level estimates should be used for general discussion only, because statistical reliability diminishes for estimates below the regional and U.S. level due to sample size.

**Keywords:** Costs of production, State-level, field crops, budgets, enterprise costs, returns

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# State-Level Costs of Production

## Major Field Crops, 1987-89

Mir B. Ali

### Introduction

Per-acre costs of producing major field crops increased slightly in 1989. Farmers generally paid higher prices for their production inputs. For example, seed prices rose 10 percent due to 1988's drought, fertilizer and chemical prices increased by 5 percent, fuel and energy prices climbed 9 percent, and wage rates were up by 8 percent.

At the U.S. level, 1989 variable cash expenses increased by 8 to 13 percent for all field crops with the exception of rice, cotton, and peanuts, where the increase was less than 5 percent. Total economic costs also rose. Oats and soybean prices dropped sharply, reducing per-acre value of production. Corn and barley prices fell slightly. For more details, refer to Economic Indicators of the Farm Sector: Costs of Production--Major Field Crops, 1989.

At the State level, per-acre costs and returns varied significantly among years and among States within a given year. Variations in yields may be explained in part by the yearly variation in weather patterns. Temperature and moisture are especially critical factors during the growing season. Yield variations together with differences in crop prices translate into fluctuations in gross and net returns. Variations in production costs among States are due to differences in tillage practices, quantities and prices of inputs, and several other production factors.

This report presents the State-level production cost and return estimates for major field crops for 1987-89 along with quantities of selected inputs, namely

seed, nitrogen (N), phosphate (P), potash (K), lime (L), gypsum (G), sulfur (S), and unpaid labor (tables 1-82). Note that rice production costs and returns are for 1988 and 1989 only. Average use of machines by crop and by State is also presented (app. tables 1-82). The corresponding 1987-89 regional and U.S. estimates were published in Economic Indicators of the Farm Sector: Costs of Production--Major Field Crops, 1989. USDA's Economic Research Service (ERS) annually estimates production costs and returns of major field crops. The estimates are calculated on a per-planted-acre basis and include both operator and landlord costs and returns. Costs are included only for the acreage planted with the intention of being harvested for grain.

### Effects of Government Programs Not Included

Most of the following cost and return statements exclude the effects of direct Government programs. As data become available, additional statements will be prepared for program commodities that include these effects. Rice is the only commodity for which Government programs have been considered, demonstrating that returns to management and risk became positive when costs and returns from participation in Government programs are calculated. Results are published in Effects of Government Programs on Rice Production Costs and Returns, 1988 and U.S. Rice Production Practices and Costs, 1988.

These estimates reflect average production practices, yields, and prices paid and received by farmers. Per-acre costs vary widely among farmers due to differences in inputs, and type and size of machinery used. This variability means that costs and returns for individual farmers may differ considerably from average estimates presented in this report. Consequently, users should understand the objectives and procedures of the ERS estimates. Also, note that while the difference between expenses and returns determines the profitability and performance of a farm, it is not an adequate measure of the well-being of farms producing more than one commodity.

### Structure of Accounts

ERS constructs State-level, per-acre production cost estimates of actual input and machinery use for each crop. These estimates conform to the current ERS definitions and structure of accounts.

Production cost and return estimates are presented in the form of a commodity account, which lists gross value of production, variable cash expenses, fixed cash expenses, economic costs, and two measures of returns.

Value of production is estimated by multiplying the harvest-period price times planted-acre yield plus any value of secondary products, such as straw. Harvest-period prices, rather than season-average prices, are used since using season-average prices would reflect marketing factors like storage. Marketing is not a production cost, so storage costs are not included. Harvest-period prices and yields are specified at the State level. Payments from Government farm programs, such as deficiency and disaster payments, are excluded from gross value of production. State-level yields are updated annually from Crop Production. Prices are updated annually from Agricultural Prices.

Variable cash expenses are those that are incurred only if production takes place. Expense items included in this category are seed, fertilizers, lime and gypsum, chemicals, custom operations, hired labor, fuel, electricity, lubrication, repairs, drying, technical services, cotton ginning, and purchased irrigation water.

The operator or landlord is also responsible for fixed expenses, regardless of whether he/she produces the crop that year. Fixed expenses

include general farm overhead, taxes, insurance, and interest on operating and real estate loans. Note that overhead costs consist of expenses for utilities (excluding water and electricity for irrigation), farm shop and office equipment and supplies, accounting and legal fees, blanket insurance policies, fence maintenance and repairs, motor vehicle registration, chemicals applied to maintain farm roads and ditches, and any other general expenses attributable to the entire farm business.

Economic costs are long-term costs that reflect the production situation as if the operation and landlord fully owned all production inputs. A cost is calculated for all inputs, whether owned, rented, or financed. Economic costs include variable cash expenses, general farm overhead, taxes and insurance, capital replacement, and an imputed cost of capital invested in the production process, unpaid labor, and land.

Capital replacement cost represents a portion of the value of the machinery and equipment used up during the year in the production of a crop plus an additional cost required to bring these items up to the same level of quality that they were at the beginning of the period. Opportunity costs are imputed from values of capital, land, and unpaid labor in alternative uses. The cost of operating capital is the expense of carrying input expenses from the time they are used until harvest. ERS imputes this cost at the 6-month U.S. Treasury bill rate. The cost of having capital invested in farm machinery and equipment is measured using the longrun rate of return to production assets from current income. ERS values land in cost-of-production accounts at its rental value. The land rental rates are a composite of share (valued at the harvest-period price) and cash rental rates for a particular crop, minus real estate taxes that already have been included in other taxes and the value of inputs supplied by the landlord. Double-cropped acreage is counted half for each of the two crops. Crop acreage planted after fallow is charged rental value for 2 years. ERS imputes the value of unpaid labor (hired labor is a variable cash expense) at the wage rate for agricultural workers. Additional value of unpaid labor, such as for management and entrepreneurial skill, and the return to risk are measured as a residual return. The cost of peanut poundage quota, whether owned or rented, is included in the peanut economic costs and is measured at its cash rental rate.

The two returns in each budget analyze the financial position of the enterprise. Gross value of production less cash expenses is the net cash return that measures the shortrun cash-flow position. Net cash return indicates the minimum return needed from a crop to keep it in production. Gross value of production less economic costs is the residual returns to management and risk. Residual returns to management and risk measure the longrun position of the enterprise. This should be used when comparing one commodity with another to assess relative returns. Because of the exclusion of Government payments from the gross value of production, the returns to management and risk should be viewed only as a proxy for actual profit or loss.

### Estimation Procedures

Procedures used to derive an estimate for a particular component of costs or returns are constrained by available data. The principal data source is USDA's Farm Costs and Returns Survey (FCRS), which collects production data for each crop on a 4-year rotation. For a year in which a survey is conducted, there are four general approaches: direct costing, allocation of whole-farm costs, valuing of input quantities, and indirect costing (fig. 1). The methodology for updating costs in nonsurvey years is dictated by the approach adopted.

Direct costing is achieved by simply summarizing responses to a question about the amount paid for a particular item on a particular crop. This method is best suited for estimating components of variable costs such as chemicals, custom operations, hired labor, purchased irrigation water, and technical services. In nonsurvey years these costs are adjusted using indices constructed to reflect year-to-year changes in prices.

Indirect costing involves the combination of survey information and engineering formulas. Detailed information is collected on the survey regarding the machinery complement used in production. In addition, data are obtained on hours of machine use, times-over the acreage, size of machine, and type of fuel used. This information is used to support equations of technical relationships that describe fuel consumption, repair requirements, and replacement costs. In nonsurvey years, these items are updated by using machinery and fuel prices and other secondary data. Engineering formulas are modified to reflect technological advances as they occur.

Allocating whole-farm expenses occurs for inputs that are not specifically associated with production of a commodity. In addition to obtaining information on the expense, data on quantities of production are collected for all enterprises on a farm. Secondary data on crop prices are used to

Figure 1  
Approaches used to estimate cost of crop production components

Direct costing	Allocating whole-farm expenses	Valuing quantities of inputs	Indirect costing	Multi-approach estimate
<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Custom operations</li> <li>• Hired labor</li> <li>• Purchased irrigation water</li> <li>• Technical services</li> <li>• Custom drying</li> <li>• Miscellaneous</li> <li>• Peanut quota</li> </ul>	<ul style="list-style-type: none"> <li>• General farm overhead</li> <li>• Interest</li> </ul>	<ul style="list-style-type: none"> <li>• Seed</li> <li>• Fertilizer</li> <li>• Lime, gypsum</li> <li>• Unpaid labor</li> <li>• Drying</li> <li>• Ginning</li> </ul>	<ul style="list-style-type: none"> <li>• Fuel, lubrication, electricity</li> <li>• Repairs</li> <li>• Capital replacement</li> </ul>	<ul style="list-style-type: none"> <li>• Operating capital</li> <li>• Nonland capital</li> <li>• Land</li> <li>• Taxes and insurance</li> </ul>

determine the whole farm's total value of production. Expenses incurred by the whole farm for a particular input are then allocated to an enterprise based on its share of total value of production. These expenses, in nonsurvey years, are updated by the percentage change in total farm overhead and interest reported in the FCRS.

Valuing quantities of inputs requires survey data of the physical quantities of inputs used in production. This approach is used for inputs such as seed, fertilizer, lime, gypsum, and unpaid labor. Costs are estimated by multiplying quantities used by State or regional prices. Quantities are held constant in nonsurvey years and multiplied by new State-level price information.

Components of economic costs such as operating capital, nonland capital, and land are estimated using a combination of these approaches. For example, operating capital cost is total variable expenses times the 6-month Treasury bill rate, fertilizer cost is based on valuing quantities, while repairs are computed using indirect costing through the engineering formulas.

### Data Sources

Production cost estimates are based on information obtained from the Farm Costs and Returns Survey (FCRS). The FCRS is a multiframe, stratified survey conducted annually by ERS and USDA's National Agricultural Statistics Service (NASS). Each year, there are multiple versions of the FCRS: an indepth, whole-farm version, and commodity cost-of-production (COP) versions. While all versions have questions about whole-farm expenses and income, each COP version gathers detailed information about input use, field operations, and production costs of a particular crop. Because of survey costs, USDA cannot undertake detailed surveys of every commodity each year. Thus, the FCRS covers each commodity about every 4 years. In nonsurvey years, ERS assumes that production practices and technology remain constant with the survey year and updates the costs with price and yield data from the whole-farm versions of FCRS, ERS and NASS publications, and other data sources.

The primary objective of the survey, to generate U.S. and regional average COP estimates, was accomplished by aggregating State COP estimates

to produce the national and regional estimates. Therefore, the estimates at the national and regional level are statistically reliable. Included in this report are estimates for those States that have sufficient sample size. Refer to appendix table 83 for the number of farms surveyed and the year of survey data.

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\_\_\_\_\_. Crop Production. Annual summaries. 1987-89.



Table 1a--Idaho: Barley production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	178.63	167.50	205.17
Barley straw	6.37	8.39	9.12
Total, gross value of production	185.00	175.89	214.29
Cash expenses:			
Seed (98.1 lbs)	10.79	9.61	11.77
Fertilizer (59.4N, 11.1P, 4.3K lbs)	17.62	18.29	20.12
Lime and gypsum (.06L ton)	0.98	0.95	0.95
Chemicals	8.03	8.16	8.55
Custom operations	6.72	5.90	6.93
Fuel, lube, and electricity	26.51	25.48	27.03
Repairs	15.14	15.66	16.25
Hired labor	12.82	13.38	14.71
Purchased irrigation water	10.03	10.03	10.03
Technical services	0.23	0.23	0.23
Total, variable cash expenses	108.87	107.69	116.57
General farm overhead	10.74	11.38	11.02
Taxes and insurance	10.58	10.23	10.84
Interest on operating loans	6.38	5.64	5.95
Interest on real estate	10.03	9.30	9.46
Total, fixed cash expenses	37.73	36.55	37.27
Total, cash expenses	146.60	144.24	153.84
Gross value of production less cash expenses	38.40	31.65	60.45
Harvest-period price (dollars/bu.)	2.44	2.89	3.00
Yield (bu./planted acre)	73.21	57.96	68.39

Table 1b--Idaho: Barley production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	178.63	167.50	205.17
Barley straw	6.37	8.39	9.12
Total, gross value of production	185.00	175.89	214.29
Economic (full ownership) costs:			
Variable cash expenses	108.87	107.69	116.57
General farm overhead	10.74	11.38	11.02
Taxes and insurance	10.58	10.23	10.84
Capital replacement	40.69	41.81	43.98
Operating capital	2.08	2.38	2.96
Other nonland capital	7.30	8.69	10.09
Land	55.98	55.83	66.27
Unpaid labor (2.5 hrs)	11.00	11.47	12.62
Total, economic costs	247.24	249.48	274.35
Residual returns to management and risk	-62.24	-73.59	-60.06
Harvest-period price (dollars/bu.)	2.44	2.89	3.00
Yield (bu./planted acre)	73.21	57.96	68.39

Table 2a--Minnesota: Barley production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	57.86	64.19	133.67
Barley straw	2.06	3.12	2.39
Total	59.92	67.31	136.06
Cash expenses:			
Seed (91.8 lbs)	6.80	7.07	11.39
Fertilizer (57.2N, 30.7P, 20.7K lbs)	16.37	19.91	20.40
Chemicals	7.40	7.52	7.88
Custom operations	0.48	0.36	0.56
Fuel, lube, and electricity	6.49	6.03	7.39
Repairs	6.37	6.34	7.48
Hired labor	3.73	3.84	4.02
Purchased irrigation water	10.52	10.52	10.52
Technical services	0.21	0.21	0.21
Total, variable cash costs	58.37	61.80	69.85
General farm overhead	6.85	7.26	7.03
Taxes and insurance	10.18	9.73	11.22
Interest on operating loans	4.82	4.26	4.50
Interest on real estate	6.65	6.17	6.27
Total, fixed cash expenses	28.50	27.42	29.02
Total, cash expenses	86.87	89.22	98.87
Gross value of production less cash expenses	-26.95	-21.91	37.19
Harvest-period price (dollars/bu.)	1.40	2.95	2.81
Yield (bu./planted acre)	41.33	21.76	47.57

Table 2b--Minnesota: Barley production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	57.86	64.19	133.67
Barley straw	2.06	3.12	2.39
Total, gross value of production	59.92	67.31	136.06
Economic (full ownership) costs:			
Variable cash expenses	58.37	61.80	69.85
General farm overhead	6.85	7.26	7.03
Taxes and insurance	10.18	9.73	11.22
Capital replacement	26.81	26.98	33.25
Operating capital	0.70	0.87	1.13
Other nonland capital	4.93	5.68	7.82
Land	35.30	39.62	48.91
Unpaid labor (2.4 hrs)	11.20	11.54	12.06
Total, economic costs	154.34	163.48	191.27
Residual returns to management and risk	-94.42	-96.17	-55.21
Harvest-month price (dollars/bu.)	1.40	2.95	2.81
Yield (bu./planted acre)	41.33	21.76	47.57

Table 3a--Montana: Barley production: cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	75.61	46.01	105.63
Barley straw	1.99	3.42	3.09
Total, gross value of production	77.60	49.43	108.72
Cash expenses:			
Seed (66.1 lbs)	4.49	5.55	5.88
Fertilizer (36.9N, 27.8P, 5.5K lbs)	13.56	15.73	16.18
Chemicals	6.29	6.39	6.70
Custom operations	2.47	1.51	2.63
Fuel, lube, and electricity	4.11	3.92	4.58
Repairs	6.19	5.63	6.71
Hired labor	7.02	7.33	8.05
Purchased irrigation water	3.96	3.96	3.96
Technical services	0.22	0.22	0.22
Total, variable cash expenses	48.31	50.24	54.91
General farm overhead	5.40	5.72	5.54
Taxes and insurance	5.83	5.00	6.68
Interest on operating loans	3.64	3.22	3.39
Interest on real estate	6.51	6.04	6.14
Total, fixed cash expenses	21.38	19.98	21.75
Total, cash expenses	69.69	70.22	76.66
Gross value of production less cash expenses	7.91	-20.79	32.06
Harvest-period price (dollars/bu.)	1.84	2.76	2.61
Yield (bu./planted acre)	41.09	16.67	40.47

Table 3b--Montana: Barley production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	75.61	46.01	105.63
Barley straw	1.99	3.42	3.09
Total, gross value of production	77.60	49.43	108.72
Economic (full ownership) costs:			
Variable cash expenses	48.31	50.24	54.91
General farm overhead	5.40	5.72	5.54
Taxes and insurance	5.83	5.00	6.68
Capital replacement	23.00	19.81	25.83
Operating capital	0.69	0.86	1.04
Other nonland capital	4.24	4.20	5.99
Land	24.94	18.01	33.39
Unpaid labor (1.8 hrs)	7.94	8.28	9.11
Total, economic costs	120.35	112.12	142.49
Residual returns to management and risk	-42.75	-62.69	-33.77
Harvest-month price (dollars/bu.)	1.84	2.76	2.61
Yield (bu./planted acre)	41.09	16.67	40.47

Table 4a--North Dakota: Barley production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Barley	59.86	52.42	83.70
Barley straw	0.82	1.75	1.55
Total, gross value of production	60.68	54.17	85.25
Cash expenses:			
Seed (74.1 lbs)	3.63	4.00	6.96
Fertilizer (50.2N, 20.9P, 1.8K lbs)	10.99	12.35	13.00
Chemicals	4.49	4.56	4.78
Custom operations	1.47	0.85	1.33
Fuel, lube, and electricity	4.91	4.20	5.16
Repairs	5.66	4.94	7.10
Hired labor	3.31	3.57	3.94
Technical services	0.36	0.36	0.36
Total, variable cash expenses	34.82	34.83	42.63
General farm overhead	4.84	5.13	4.97
Taxes and insurance	5.70	5.02	6.25
Interest on operating loans	3.02	2.67	2.82
Interest on real estate	6.08	5.64	5.73
Total, fixed cash expenses	19.64	18.46	19.77
Total, cash expenses	54.46	53.29	62.40
Gross value of production less cash expenses	6.22	0.88	22.85
Harvest-period price (dollars/bu.)	1.29	3.25	2.39
Yield (bu./planted acre)	46.40	16.13	35.02

Table 4b--North Dakota: Barley production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Barley	59.86	52.42	83.70
Barley straw	0.82	1.75	1.55
Total, gross value of production	60.68	54.17	85.25
Economic (full ownership) costs:			
Variable cash expenses	34.82	34.83	42.63
General farm overhead	4.84	5.13	4.97
Taxes and insurance	5.70	5.02	6.25
Capital replacement	20.39	18.69	24.78
Operating capital	0.48	0.59	0.84
Other nonland capital	3.62	3.66	5.54
Land	21.74	21.02	25.23
Unpaid labor (2.3 hrs)	11.14	11.93	13.27
Total, economic costs	102.73	100.87	123.51
Residual returns to management and risk	-42.05	-46.70	-38.26
Harvest-period price (dollars/bu.)	1.29	3.25	2.39
Yield (bu./planted acre)	46.40	16.13	35.02

**Table 5a--Pennsylvania: Barley production cash costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	80.51	156.09	112.55
Barley straw	53.60	63.71	55.93
Total, gross value of production	134.11	219.80	168.48
Cash expenses:			
Seed (108.1 lbs)	15.79	15.35	17.41
Fertilizer (44N, 33.5P, 51K lbs)	20.57	24.97	27.34
Lime and gypsum (.2L ton)	4.86	4.46	4.84
Chemicals	2.66	2.70	2.83
Custom operations	6.93	7.96	7.87
Fuel, lube, and electricity	6.65	7.00	7.83
Repairs	7.34	8.02	8.32
Hired labor	9.72	11.62	12.09
Total, variable cash expenses	74.52	82.08	88.53
General farm overhead	5.52	5.85	5.67
Taxes and insurance	20.71	22.16	23.58
Interest on operating loans	1.72	1.52	1.60
Interest on real estate	2.73	2.53	2.57
Total, fixed cash expenses	30.68	32.06	33.42
Total, cash expenses	105.20	114.14	121.95
Gross value of production less cash expenses	28.91	105.66	46.53
Harvest-period price (dollars/bu.)	1.53	2.58	2.02
Yield (bu./per planted acre)	52.62	60.50	55.72

**Table 5b--Pennsylvania: Barley production economic costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Barley	80.51	156.09	112.55
Barley straw	53.60	63.71	55.93
Total	134.11	219.80	168.48
Economic (full ownership) costs:			
Variable cash expenses	74.52	82.08	88.53
General farm overhead	5.52	5.85	5.67
Taxes and insurance	20.71	22.16	23.58
Capital replacement	24.50	26.10	27.90
Operating capital	2.38	3.01	3.79
Other nonland capital	4.64	5.82	6.72
Land	29.63	33.39	34.86
Unpaid labor (2.8 hrs)	12.92	14.58	16.07
Total, economic costs	174.82	192.99	207.12
Residual returns to management and risk	-40.71	26.81	-38.64
Harvest-period price (dollars/bu.)	1.53	2.58	2.02
Yield (bu./planted acre)	52.62	60.50	55.72

Table 6a--South Dakota: Barley production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Barley	51.19	36.79	67.65
Barley straw	0.34	0.60	0.56
Total, gross value of production	51.53	37.39	68.21
Cash expenses:			
Seed (87.4 lbs)	5.33	5.33	8.21
Fertilizer (24.8N, 15.1P, 1.6K lbs)	7.59	8.32	9.26
Chemicals	3.87	3.93	4.12
Custom operations	2.49	1.39	2.17
Fuel, lube, and electricity	4.30	3.76	4.29
Repairs	5.11	4.12	5.10
Hired labor	0.69	0.74	0.82
Technical services	0.17	0.17	0.17
Total, variable cash expenses	29.55	27.76	34.14
General farm overhead	3.16	3.35	3.24
Taxes and insurance	6.28	5.42	6.27
Interest on operating loans	2.49	2.20	2.32
Interest on real estate	3.24	3.00	3.05
Total, fixed cash expenses	15.17	13.97	14.88
Total, cash expenses	44.72	41.73	49.02
Gross value of production less cash expenses	6.81	-4.34	19.19
Harvest-period price (dollars/bu.)	1.31	3.18	2.46
Yield (bu./planted acre)	39.08	11.57	27.50

Table 6b--South Dakota: Barley production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Barley	51.19	36.79	67.65
Barley straw	0.34	0.60	0.56
Total, gross value of production	51.53	37.39	68.21
Economic (full ownership) costs:			
Variable cash expenses	29.55	27.76	34.14
General farm overhead	3.16	3.35	3.24
Taxes and insurance	6.28	5.42	6.27
Capital replacement	18.46	15.10	18.50
Operating capital	0.54	0.64	0.87
Other nonland capital	3.31	2.99	4.18
Land	16.41	16.38	18.26
Unpaid labor (2.5 hrs)	11.93	12.85	14.21
Total, economic costs	89.64	84.49	99.67
Residual returns to management and risk	-38.11	-47.10	-31.46
Harvest-period price (dollars/bu.)	1.31	3.18	2.46
Yield (bu./planted acre)	39.08	11.57	27.50

Table 7a--Washington: Barley production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Barley	97.82	150.25	134.14
Barley straw	0.33	0.42	0.42
Total, gross value of production	98.15	150.67	134.56
Cash expenses:			
Seed (77.4 lbs)	7.28	8.05	9.21
Fertilizer (53.1N, 3.2P, .8K lbs)	14.12	14.30	17.33
Chemicals	7.63	7.75	8.12
Custom operations	0.35	0.38	0.39
Fuel, lube, and electricity	4.98	4.88	5.99
Repairs	7.40	7.85	8.11
Hired labor	8.09	7.96	8.52
Technical services	0.04	0.04	0.04
Total, variable cash expenses	49.89	51.21	57.71
General farm overhead	6.91	7.32	7.09
Taxes and insurance	5.37	5.43	5.66
Interest on operating loans	4.64	4.10	4.33
Interest on real estate	6.99	6.48	6.59
Total, fixed cash expenses	23.91	23.33	23.67
Total, cash expenses	73.80	74.54	81.38
Gross value of production less cash expenses	24.35	76.13	53.18
Harvest-period price (dollars/bu.)	1.82	2.51	2.36
Yield (bu./planted acre)	53.75	59.86	56.84

Table 7b--Washington: Barley production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Barley	97.82	150.25	134.14
Barley straw	0.33	0.42	0.42
Total, gross value of production	98.15	150.67	134.56
Economic (full ownership) costs:			
Variable cash expenses	49.89	51.21	57.71
General farm overhead	6.91	7.32	7.09
Taxes and insurance	5.37	5.43	5.66
Capital replacement	18.60	19.67	21.19
Operating capital	0.95	1.11	1.45
Other nonland capital	3.29	4.06	4.72
Land	27.24	43.65	38.15
Unpaid labor (1.6 hrs)	9.12	8.98	9.61
Total, economic costs	121.37	141.43	145.58
Residual returns to management and risk	-23.22	9.24	-11.02
Harvest-period price (dollars/bu.)	1.82	2.51	2.36
Yield (bu./planted acre)	53.75	59.86	56.84

Table 8a--Alabama: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Corn			
Total, gross value of production	123.67	97.24	177.80
	123.67	97.24	177.80
Cash expenses:			
Seed (12.3 lbs)			
Fertilizer (135.9N, 43.8P, 43.5K (bs))	16.32	15.58	17.30
Lime and gypsum	38.60	48.61	54.32
Chemicals	2.32	2.25	2.25
Custom operations	15.69	15.94	16.70
Fuel, lube, and electricity	2.19	1.95	2.15
Repairs	14.80	12.53	17.02
Hired labor	15.27	12.10	17.69
Drying	8.64	8.64	9.12
Technical services	2.35	1.26	2.68
Total, variable cash expenses	0.05	0.05	0.05
	116.23	118.91	139.28
General farm overhead			
Taxes and insurance	6.48	6.87	6.65
Interest on operating loans	7.88	6.64	8.36
Interest on real estate	2.61	2.31	2.43
Total, fixed cash expenses	4.29	3.98	4.05
	21.26	19.80	21.49
Total, cash expenses	137.49	138.71	160.77
Gross value of production less cash expenses	-13.82	-41.47	17.03
Harvest-period price (dollars/bu.)	1.91	2.86	2.50
Yield (bu./planted acre)	64.75	34.00	71.12

Table 8b--Alabama: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Corn			
Total, gross value of production	123.67	97.24	177.80
	123.67	97.24	177.80
Economic (full ownership) costs:			
Variable cash expenses			
General farm overhead	116.23	118.91	139.28
Taxes and insurance	6.48	6.87	6.65
Capital replacement	7.88	6.64	8.36
Operating capital	29.18	25.63	32.93
Other nonland capital	2.76	3.46	4.35
Land	5.62	5.46	8.18
Unpaid labor (5.5 hrs)	21.17	17.02	27.18
Total, economic costs	23.89	25.43	26.86
	213.21	209.42	253.79
Residual returns to management and risk	-89.54	-112.18	-75.99
Harvest-period price (dollars/bu.)	1.91	2.86	2.50
Yield (bu./planted acre)	64.75	34.00	71.12



Table 9a--Illinois: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Corn	210.98	186.84	276.50
Total, gross value of production	210.98	186.84	276.50
Cash expenses:			
Seed (14.6 lbs)	19.35	19.06	21.68
Fertilizer (156.4N, 76.9P, 102.6K lbs)	47.11	58.61	59.35
Lime and gypsum (.24L ton)	3.05	3.10	2.86
Chemicals	22.86	23.23	24.33
Custom operations	4.06	3.32	4.40
Fuel, lube, and electricity	7.38	7.07	8.37
Repairs	6.09	5.62	6.58
Hired labor	6.61	6.61	6.71
Drying	9.53	5.73	9.86
Technical services	0.32	0.32	0.32
Total, variable cash expenses	126.36	132.67	144.46
General farm overhead	11.90	12.61	12.21
Taxes and insurance	16.77	16.65	18.24
Interest on operating loans	6.35	5.61	5.92
Interest on real estate	12.26	11.37	11.56
Total, fixed cash expenses	47.28	46.24	47.93
Total, cash expenses	173.64	178.91	192.39
Gross value of production less cash expenses	37.34	7.93	84.11
Harvest-period price (dollars/bu.)	1.60	2.57	2.25
Yield (bu./planted acre)	131.86	72.70	122.89

Table 9b--Illinois: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Corn	210.98	186.84	276.50
Total, gross value of production	210.98	186.84	276.50
Economic (full ownership) costs:			
Variable cash expenses	126.36	132.67	144.46
General farm overhead	11.90	12.61	12.21
Taxes and insurance	16.77	16.65	18.24
Capital replacement	33.34	34.00	38.35
Operating capital	2.89	3.64	4.39
Other nonland capital	5.08	5.83	7.22
Land	48.94	40.23	65.32
Unpaid labor (4.1 hrs)	21.51	22.36	22.70
Total, economic costs	266.79	267.99	312.89
Residual returns to management and risk	-55.81	-81.15	-36.39
Harvest-period price (dollars/bu.)	1.60	2.57	2.25
Yield (bu./planted acre)	131.86	72.70	122.89

Table 10a--Indiana: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	214.19	215.31	306.80
Cash expenses:			
Seed (14.2 lbs)	19.01	18.31	21.28
Fertilizer (141.4N, 65P, 102.1K lbs)	43.55	54.68	58.37
Lime and gypsum (.21L ton)	2.67	2.71	2.50
Chemicals	17.42	17.70	18.54
Custom operations	5.14	4.43	5.33
Fuel, lube, and electricity	7.74	7.03	8.80
Repairs	6.91	6.20	7.60
Hired labor	8.16	8.16	8.28
Drying	10.07	7.28	11.81
Technical services	0.19	0.19	0.19
Total, variable cash expenses	120.86	126.69	142.70
General farm overhead	11.85	12.56	12.16
Taxes and insurance	14.79	14.49	16.15
Interest on operating loans	4.41	3.90	4.11
Interest on real estate	13.38	12.41	12.62
Total, fixed cash expenses	44.43	43.36	45.04
Total, cash expenses	165.29	170.05	187.74
Gross value of production less cash expenses	48.90	45.26	119.06
Harvest-period price (dollars/bu.)	1.59	2.62	2.32
Yield (bu./planted acre)	134.71	82.18	132.24

Table 10b--Indiana: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	214.19	215.31	306.80
Economic (full ownership) costs:			
Variable cash expenses	120.86	126.69	142.70
General farm overhead	11.85	12.56	12.16
Taxes and insurance	14.79	14.49	16.15
Capital replacement	31.07	31.22	35.34
Operating capital	2.73	3.40	4.26
Other nonland capital	5.14	5.76	7.33
Land	50.56	48.73	72.75
Unpaid labor (3.5 hrs)	18.40	19.13	19.41
Total, economic costs	255.40	261.98	310.10
Residual returns to management and risk	-41.21	-46.67	-3.30
Harvest-period price (dollars/bu.)	1.59	2.62	2.32
Yield (bu./planted acre)	134.71	82.18	132.24

Table 11a--Iowa: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	189.23	210.70	248.77
Cash expenses:			
Seed (14.7 lbs)	19.08	21.14	21.87
Fertilizer (142.1N, 48.5P, 57.5K lbs)	35.10	43.35	44.03
Lime and gypsum (.36L ton)	4.57	4.64	4.28
Chemicals	23.50	23.88	25.02
Custom operations	5.70	4.96	6.21
Fuel, lube, and electricity	7.04	6.64	7.84
Repairs	6.37	6.03	6.86
Hired labor	6.94	6.94	7.61
Drying	11.28	6.81	9.50
Technical services	0.12	0.12	0.12
Total, variable cash expenses	119.70	124.51	133.34
General farm overhead	11.07	11.73	11.36
Taxes and insurance	19.14	19.12	20.86
Interest on operating loans	7.88	6.96	7.35
Interest on real estate	14.49	13.44	13.66
Total, fixed cash expenses	52.58	51.25	53.23
Total, cash expenses	172.28	175.76	186.57
Gross value of production less cash expenses	16.95	34.94	62.20
Harvest-period price (dollars/bu.)	1.46	2.52	2.11
Yield (bu./planted acre)	129.61	83.61	117.90

Table 11b--Iowa: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	189.23	210.70	248.77
Economic (full ownership) costs:			
Variable cash expenses	119.70	124.51	133.34
General farm overhead	11.07	11.73	11.36
Taxes and insurance	19.14	19.12	20.86
Capital replacement	28.88	29.46	32.74
Operating capital	2.63	3.37	4.05
Other nonland capital	4.77	5.51	6.73
Land	50.82	57.71	70.33
Unpaid labor (4.7 hrs)	22.37	23.77	26.05
Total, economic costs	259.38	275.18	305.46
Residual returns to management and risk	-70.15	-64.48	-56.69
Harvest-period price (dollars/bu.)	1.46	2.52	2.11
Yield (bu./planted acre)	129.61	83.61	117.90

Table 12a--Kansas: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Corn	202.96	339.78	270.79
Total, gross value of production	202.96	339.78	270.79
Cash expenses:			
Seed (12.2 lbs)	17.42	16.56	18.76
Fertilizer (153.3N, 37.3P, 16.9K lbs)	30.29	34.73	37.91
Chemicals	24.26	24.65	25.82
Custom operations	5.50	5.75	6.49
Fuel, lube, and electricit	12.01	12.24	12.89
Repairs	9.92	10.57	10.85
Hired labor	6.72	6.72	7.43
Purchased irrigation water	0.97	0.97	0.97
Drying	4.46	4.77	4.52
Technical services	0.93	0.93	0.93
Total, variable cash expenses	112.48	117.89	126.57
General farm overhead	7.50	7.95	7.70
Taxes and insurance	8.80	9.02	9.42
Interest on operating loans	5.29	4.67	4.93
Interest on real estate	8.58	7.96	8.09
Total, fixed cash expenses	30.17	29.60	30.14
Total, cash expenses	142.65	147.49	156.71
Gross value of production less cash expenses	60.31	192.29	114.08
Harvest-period price (dollars/bu.)	1.72	2.73	2.21
Yield (bu./planted acre)	118.00	124.46	122.53

Table 12b--Kansas: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Corn	202.96	339.78	270.79
Total, gross value of production	202.96	339.78	270.79
Economic (full ownership) costs:			
Variable cash expenses	112.48	117.89	126.57
General farm overhead	7.50	7.95	7.70
Taxes and insurance	8.80	9.02	9.42
Capital replacement	28.33	30.10	31.71
Operating capital	2.68	3.20	4.00
Other nonland capital	5.10	6.34	7.24
Land	55.38	102.93	54.91
Unpaid labor (2.5 hrs)	12.10	13.03	14.41
Total, economic costs	232.37	290.46	255.96
Residual returns to management and risk	-29.41	49.32	14.83
Harvest-period price (dollars/bu.)	1.72	2.73	2.21
Yield (bu./planted acre)	118.00	124.46	122.53

Table 13a--Kentucky: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	179.39	191.60	273.77
Cash expenses:			
Seed (14.7 lbs)	18.39	18.09	22.21
Fertilizer (120.2N, 75.7P, 88.3K lbs)	45.00	54.31	56.44
Lime and gypsum (.27L ton)	4.48	4.35	4.35
Chemicals	22.91	23.28	24.39
Custom operations	3.59	2.95	3.59
Fuel, lube, and electricity	8.25	7.35	9.79
Repairs	9.89	8.92	11.31
Hired labor	8.09	8.09	8.42
Drying	5.74	4.03	6.28
Technical services	0.02	0.02	0.02
Total, variable cash expenses	126.36	131.39	146.80
General farm overhead	9.41	9.97	9.66
Taxes and insurance	7.35	6.88	7.90
Interest on operating loans	2.12	1.87	1.98
Interest on real estate	13.01	12.06	12.27
Total, fixed cash expenses	31.89	30.78	31.81
Total, cash expenses	158.25	162.17	178.61
Gross value of production less cash expenses	21.14	29.43	95.16
Harvest-period price (dollars/bu.)	1.74	2.72	2.38
Yield (bu./planted acre)	103.10	70.44	115.03

Table 13b--Kentucky: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	179.39	191.60	273.77
Economic (full ownership) costs:			
Variable cash expenses	126.36	131.39	146.80
General farm overhead	9.41	9.97	9.66
Taxes and insurance	7.35	6.88	7.90
Capital replacement	24.45	23.88	28.25
Operating capital	2.87	3.56	4.42
Other nonland capital	4.68	5.13	6.88
Land	31.97	32.49	59.33
Unpaid labor (4 hrs)	17.43	19.49	20.29
Total, economic costs	224.52	232.79	283.53
Residual returns to management and risk	-45.13	-41.19	-9.76
Harvest-period price (dollars/bu.)	1.74	2.72	2.38
Yield (bu./planted acre)	103.10	70.44	115.03

Table 14a--Michigan: Corn production cash costs and return per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	148.58	175.81	241.54
Cash expenses:			
Seed (13.8 lbs)	17.72	17.44	19.65
Fertilizer (115.1N, 68.7P, 96.5K lbs)	41.19	50.65	52.22
Lime and gypsum (.03L ton)	0.38	0.39	0.36
Chemicals	18.71	19.01	19.92
Custom operations	7.80	6.75	8.82
Fuel, lube, and electricity	6.92	6.56	7.71
Repairs	6.31	6.15	7.36
Hired labor	11.38	11.38	11.90
Drying	6.13	4.50	7.52
Technical services	0.30	0.30	0.30
Total, variable cash expenses	116.84	123.13	135.76
General farm overhead	9.97	10.57	10.23
Taxes and insurance	21.77	21.71	23.87
Interest on operating loans	4.17	3.68	3.89
Interest on real estate	9.97	9.24	9.40
Total, fixed cash expenses	47.88	45.20	47.39
Total, cash expenses	162.72	168.33	183.15
Gross value of production less cash expenses	-14.14	7.48	58.39
Harvest-period price (dollars/bu.)	1.58	2.59	2.17
Yield (bu./planted acre)	94.04	67.88	111.31

Table 14b--Michigan: Corn production economic costs and return per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	148.58	175.81	241.54
Economic (full ownership) costs:			
Variable cash expenses	116.84	123.13	135.76
General farm overhead	9.97	10.57	10.23
Taxes and insurance	21.77	21.71	23.87
Capital replacement	30.58	31.12	35.19
Operating capital	3.19	3.98	4.86
Other nonland capital	5.43	6.24	8.05
Land	18.45	19.30	22.66
Unpaid labor (4.2 hrs)	19.53	20.11	21.03
Total, economic costs	225.76	236.16	261.65
Residual returns to management and risk	-77.18	-60.35	-20.11
Harvest-period price (dollars/bu.)	1.58	2.59	2.17
Yield (bu./planted acre)	94.04	67.88	111.31

Table 15a--Minnesota: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Corn	181.61	176.41	242.78
Total, gross value of production	181.61	176.41	242.78
Cash expenses:			
Seed (14.1 lbs)	19.90	18.91	20.88
Fertilizer (115.2N, 39P, 44.1K lbs)	28.43	34.91	35.68
Chemicals	20.88	21.22	22.23
Custom operations	6.31	4.43	6.53
Fuel, lube, and electricity	7.81	7.41	8.39
Repairs	6.36	6.34	7.02
Hired labor	5.41	5.41	5.66
Drying	11.13	6.79	10.92
Technical services	0.19	0.19	0.19
Total, variable cash expenses	106.42	105.61	117.50
General farm overhead	12.89	13.66	13.23
Taxes and insurance	12.92	12.82	13.89
Interest on operating loans	7.95	7.02	7.41
Interest on real estate	14.32	13.28	13.50
Total, fixed cash expenses	48.08	46.78	48.03
Total, cash expenses	154.50	152.39	165.53
Gross value of production less cash expenses	27.11	24.02	77.25
Harvest-period price (dollars/bu.)	1.45	2.46	1.97
Yield (bu./planted acre)	125.25	71.71	123.24

Table 15b--Minnesota: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Corn	181.61	176.41	242.78
Total, gross value of production	181.61	176.41	242.78
Economic (full ownership) costs:			
Variable cash expenses	106.42	105.61	117.50
General farm overhead	12.89	13.66	13.23
Taxes and insurance	12.92	12.82	13.89
Capital replacement	30.88	31.70	34.79
Operating capital	2.85	3.46	4.22
Other nonland capital	5.30	6.19	7.52
Land	46.54	50.15	61.29
Unpaid labor (5.3 hrs)	24.57	25.31	26.46
Total, economic costs	242.37	248.90	278.90
Residual returns to management and risk	-60.76	-72.49	-36.12
Harvest-period price (dollars/bu.)	1.45	2.46	1.97
Yield (bu./planted acre)	125.25	71.71	123.24

Table 16a--Missouri: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments): Corn	164.58	192.47	211.28
Total, gross value of production	164.58	192.47	211.28
Cash expenses:			
Seed (12.2 lbs)	16.44	16.32	18.15
Fertilizer (103.5N, 41.1P, 57.3K lbs)	31.57	38.09	41.99
Lime and gypsum (.15L ton)	1.90	1.93	1.78
Chemicals	26.12	26.54	27.80
Custom operations	3.18	3.18	3.45
Fuel, lube, and electricity	9.03	7.50	9.37
Repairs	8.66	8.04	8.96
Hired labor	4.59	4.59	5.03
Drying	5.93	4.11	5.17
Technical services	0.11	0.11	0.11
Total, variable cash expenses	107.53	110.41	121.81
General farm overhead	6.20	6.57	6.36
Taxes and insurance	9.13	8.70	9.33
Interest on operating loans	2.50	2.21	2.33
Interest on real estate	5.04	4.67	4.75
Total, fixed cash expenses	22.87	22.15	22.77
Total, cash expenses	130.40	132.56	144.58
Gross value of production less cash expenses	34.18	59.91	66.70
Harvest-period price (dollars/bu.)	1.47	2.57	2.22
Yield (bu./planted acre)	111.96	74.89	95.17

Table 16b--Missouri: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments): Corn	164.58	192.47	211.28
Total, gross value of production	164.58	192.47	211.28
Economic (full ownership) costs:			
Variable cash expenses	107.53	110.41	121.81
General farm overhead	6.20	6.57	6.36
Taxes and insurance	9.13	8.70	9.33
Capital replacement	33.02	33.27	36.79
Operating capital	2.41	2.96	3.72
Other nonland capital	6.02	6.83	8.26
Land	42.48	52.02	57.13
Unpaid labor (2.8 hrs)	13.39	14.22	15.59
Total, economic costs	220.18	234.98	258.99
Residual returns to management and risk	-55.60	-42.51	-47.71
Harvest-period price (dollars/bu.)	1.47	2.57	2.22
Yield (bu./planted acre)	111.96	74.89	95.17



Table 17a--Nebraska: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn	200.62	317.29	258.87
Total, gross value of production	200.62	317.29	258.87
Cash expenses:			
Seed (13.7 lbs)	17.67	18.08	19.73
Fertilizer (136.3N, 21.3P, 6.6K lbs)	22.95	26.22	29.04
Lime and gypsum (.04L ton)	0.65	0.64	0.63
Chemicals	12.77	12.98	13.59
Custom operations	4.02	3.93	4.27
Fuel, lube, and electricity	21.95	22.87	24.24
Repairs	14.19	14.82	15.17
Hired labor	11.50	11.50	12.72
Purchased irrigation water	1.99	1.99	1.99
Drying	11.49	10.77	10.27
Technical services	0.44	0.44	0.44
Total, variable cash expenses	119.62	124.24	132.09
General farm overhead	10.08	10.68	10.35
Taxes and insurance	11.80	11.92	12.53
Interest on operating loans	7.25	6.41	6.76
Interest on real estate	7.78	7.21	7.34
Total, fixed cash expenses	36.91	36.22	36.98
Total, cash expenses	156.53	160.46	169.07
Gross value of production less cash expenses	44.09	156.83	89.80
Harvest-period price (dollars/bu.)	1.55	2.58	2.18
Yield (bu./planted acre)	129.43	122.98	118.75

Table 17b--Nebraska: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn	200.62	317.29	258.87
Total, gross value of production	200.62	317.29	258.87
Economic (full ownership) costs:			
Variable cash expenses	119.62	124.24	132.09
General farm overhead	10.08	10.68	10.35
Taxes and insurance	11.80	11.92	12.53
Capital replacement	32.00	33.52	35.29
Operating capital	2.70	3.26	4.06
Other nonland capital	6.02	7.31	8.37
Land	59.41	94.76	78.69
Unpaid labor (4.3 hrs)	20.82	22.42	24.79
Total, economic costs	262.45	308.11	306.17
Residual returns to management and risk	-61.83	9.18	-47.30
Harvest-period price (dollars/bu.)	1.55	2.58	2.18
Yield (bu./planted acre)	129.43	122.98	118.75

Table 18a--North Carolina: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Corn	112.02	244.85	238.68
Total, gross value of production	112.02	244.85	238.68
Cash expenses:			
Seed (16.4 lbs)	20.63	21.94	23.74
Fertilizer (129.6N, 55.6P, 86K lbs)	43.79	54.41	57.61
Lime and gypsum (.07L ton)	1.66	1.62	1.69
Chemicals	23.09	23.46	24.58
Custom operations	11.66	15.10	14.20
Fuel, lube, and electricity	8.25	8.99	10.52
Repairs	8.17	10.01	11.14
Hired labor	11.41	11.41	11.75
Drying	2.20	2.99	3.56
Technical services	0.23	0.23	0.23
Total, variable cash expenses	131.09	150.16	159.02
General farm overhead	5.17	5.48	5.31
Taxes and insurance	9.33	10.01	10.75
Interest on operating loans	1.54	1.36	1.44
Interest on real estate	3.02	2.80	2.85
Total, fixed cash expenses	19.06	19.65	20.35
Total, cash expenses	150.15	169.81	179.37
Gross value of production less cash expenses	-38.13	75.04	59.31
Harvest-period price (dollars/bu.)	1.94	2.99	2.58
Yield (bu./planted acre)	57.74	81.89	92.51

Table 18b--North Carolina: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Corn	112.02	244.85	238.68
Total, gross value of production	112.02	244.85	238.68
Economic (full ownership) costs:			
Variable cash expenses	131.09	150.16	159.02
General farm overhead	5.17	5.48	5.31
Taxes and insurance	9.33	10.01	10.75
Capital replacement	20.10	22.83	25.68
Operating capital	3.07	3.86	4.72
Other nonland capital	3.84	5.27	6.48
Land	16.06	35.31	35.74
Unpaid labor (3.8 hrs)	17.91	17.91	18.47
Total, economic costs	206.57	250.83	266.17
Residual returns to management and risk	-94.55	-5.98	-27.49
Harvest-period price (dollars/bu.)	1.94	2.99	2.58
Yield (bu./planted acre)	57.74	81.89	92.51

Table 19a--Ohio: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	190.74	219.06	275.16
Cash expenses:			
Seed (15.3 lbs)	20.74	19.67	23.18
Fertilizer (130.4N, 74.1P, 78.4K lbs)	43.04	53.10	55.73
Lime and gypsum (.13L ton)	1.65	1.68	1.55
Chemicals	25.28	25.69	26.91
Custom operations	4.69	3.90	5.24
Fuel, lube, and electricity	7.81	7.01	8.55
Repairs	7.98	7.52	8.64
Hired labor	7.39	7.39	7.50
Drying	5.37	4.45	6.16
Technical services	0.32	0.32	0.32
Total, variable cash expenses	124.27	130.73	143.78
General farm overhead			
Taxes and insurance	11.13	11.80	11.42
Interest on operating loans	16.47	16.28	17.74
Interest on real estate	2.92	2.58	2.72
Total, fixed cash expenses	15.02	13.93	14.16
	45.54	44.59	46.04
Total, cash expenses	169.81	175.32	189.82
Gross value of production less cash expenses	20.93	43.74	85.34
Harvest-period price (dollars/bu.)	1.60	2.62	2.34
Yield (bu./planted acre)	119.21	83.61	117.59

Table 19b--Ohio: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	190.74	219.06	275.16
Economic (full ownership) costs:			
Variable cash expenses	124.27	130.73	143.78
General farm overhead	11.13	11.80	11.42
Taxes and insurance	16.47	16.28	17.74
Capital replacement	29.68	29.89	33.28
Operating capital	2.87	3.56	4.39
Other nonland capital	5.85	6.70	8.26
Land	40.66	45.26	55.32
Unpaid labor (4.2 hrs)	21.91	22.79	23.12
Total, economic costs	252.84	267.01	297.31
Residual returns to management and risk	-62.10	-47.95	-22.15
Harvest-period price (dollars/bu.)	1.60	2.62	2.34
Yield (bu./planted acre)	119.21	83.61	117.59

Table 20a--Pennsylvania: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	168.51	204.79	270.41
Cash expenses:			
Seed (13.8 lbs)	18.59	18.86	21.62
Fertilizer (112.6N, 63P, 45.4K lbs)	39.59	46.90	52.41
Lime and gypsum (.27L ton)	6.56	6.02	6.53
Chemicals	17.78	18.07	18.93
Custom operations	11.29	9.24	13.29
Fuel, lube, and electricity	7.91	7.77	9.47
Repairs	8.61	8.28	10.03
Hired labor	4.94	4.94	5.14
Drying	1.36	0.97	1.43
Technical services	0.25	0.25	0.25
Total, variable cash expenses	116.88	121.30	139.10
General farm overhead	7.86	8.33	8.07
Taxes and insurance	14.01	13.91	14.96
Interest on operating loans	2.29	2.02	2.14
Interest on real estate	4.71	4.37	4.44
Total, fixed cash expenses	28.87	28.63	29.61
Total, cash expenses	145.75	149.93	168.71
Gross value of production less cash expenses	22.76	54.86	101.70
Harvest-period price (dollars/bu.)	1.89	3.22	2.68
Yield (bu./planted acre)	89.16	63.60	100.90

Table 20b--Pennsylvania: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments): Corn			
Total, gross value of production	168.51	204.79	270.41
Economic (full ownership) costs:			
Variable cash expenses	116.88	121.30	139.10
General farm overhead	7.86	8.33	8.07
Taxes and insurance	14.01	13.91	14.96
Capital replacement	26.06	26.61	29.58
Operating capital	2.72	3.38	4.29
Other nonland capital	5.19	6.04	7.58
Land	22.85	24.83	27.32
Unpaid labor (4.3 hrs)	19.62	23.45	24.23
Total, economic costs	215.19	227.85	255.13
Residual returns to management and risk	-46.68	-23.06	15.28
Harvest-period price (dollars/bu.)	1.89	3.22	2.68
Yield (bu./planted acre)	89.16	63.60	100.90

Table 21a--South Dakota: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments): Corn	120.70	129.35	140.82
Total, gross value of production	120.70	129.35	140.82
Cash expenses:			
Seed (11.3 lbs)	15.93	14.46	17.63
Fertilizer (69.2N, 19.9P, 9.6K lbs)	16.51	18.35	20.77
Chemicals	11.60	11.79	12.35
Custom operations	4.58	3.67	4.84
Fuel, lube, and electricity	6.48	6.32	6.87
Repairs	7.00	6.70	7.50
Hired labor	3.06	3.06	3.38
Drying	5.27	3.69	4.63
Technical services	0.11	0.11	0.11
Total, variable cash expenses	70.54	68.15	78.08
General farm overhead	6.78	7.19	6.96
Taxes and insurance	8.26	7.95	10.18
Interest on operating loans	4.01	3.54	3.74
Interest on real estate	6.20	5.75	5.85
Total, fixed cash expenses	25.25	24.43	26.73
Total, cash expenses	95.79	92.58	104.81
Gross value of production less cash expenses	24.91	36.77	36.01
Harvest-period price (dollars/bu.)	1.47	2.43	2.00
Yield (bu./planted acre)	82.11	53.23	70.41

Table 21b--South Dakota: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments): Corn	120.70	129.35	140.82
Total, gross value of production	120.70	129.35	140.82
Economic (full ownership) costs:			
Variable cash expenses	70.54	68.15	78.08
General farm overhead	6.78	7.19	6.96
Taxes and insurance	8.26	7.95	10.18
Capital replacement	21.96	22.06	24.37
Operating capital	1.89	2.21	2.86
Other nonland capital	4.29	4.83	5.94
Land	28.21	30.76	30.56
Unpaid labor (3.6 hrs)	17.26	18.59	20.55
Total, economic costs	159.19	161.74	179.50
Residual returns to management and risk	-38.49	-32.39	-38.68
Harvest-period price (dollars/bu.)	1.47	2.43	2.00
Yield (bu./planted acre)	82.11	53.23	70.41

Table 22a--Wisconsin: Corn production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn	176.91	175.74	241.10
Total, gross value of production	176.91	175.74	241.10
Cash expenses:			
Seed (14.1 lbs)	18.47	16.21	18.75
Fertilizer (91.5N, 53.1P, 63.3K lbs)	31.98	38.72	42.03
Lime and gypsum (.06L ton)	0.76	0.77	0.71
Chemicals	22.11	22.47	23.54
Custom operations	5.80	3.84	4.76
Fuel, lube, and electricity	8.45	8.56	8.50
Repairs	7.18	7.21	7.01
Hired labor	6.41	6.41	6.70
Drying	3.89	2.29	3.79
Technical services	0.12	0.12	0.12
Total, variable cash expenses	105.17	106.60	115.91
General farm overhead	12.48	13.23	12.81
Taxes and insurance	21.61	21.67	22.62
Interest on operating loans	4.19	3.70	3.91
Interest on real estate	9.52	8.83	8.98
Total, fixed cash expenses	47.80	47.43	48.32
Total, cash expenses	152.97	154.03	164.23
Gross value of production less cash expenses	23.94	21.71	76.87
Harvest-period price (dollars/bu.)	1.51	2.69	2.20
Yield (bu./planted acre)	117.16	65.33	109.59

Table 22b--Wisconsin: Corn production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments): Corn	176.91	175.74	241.10
Total, gross value of production	176.91	175.74	241.10
Economic (full ownership) costs:			
Variable cash expenses	105.17	106.60	115.91
General farm overhead	12.48	13.23	12.81
Taxes and insurance	21.61	21.67	22.62
Capital replacement	29.01	29.80	27.65
Operating capital	2.48	2.99	3.74
Other nonland capital	5.63	6.61	6.80
Land	30.75	30.71	38.60
Unpaid labor (3.8 hrs)	17.96	18.50	19.34
Total, economic costs	225.09	230.11	247.47
Residual returns to management and risk	-48.18	-54.37	-6.37
Harvest-period price (dollars/bu.)	1.51	2.69	2.20
Yield (bu./planted acre)	117.16	65.33	109.59

Table 23a--Alabama: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Cotton	377.71	242.26	356.47
Cottonseed	31.34	38.36	40.98
Total, gross value of production	409.05	280.62	397.45
Cash expenses:			
Seed (13.2 lbs)	6.82	7.57	8.15
Fertilizer (48.2N, 52.5P, 83.8K lbs)	28.47	36.23	39.18
Lime and gypsum (.22L ton)	3.65	3.54	3.54
Chemicals	95.79	97.33	101.97
Custom operations	8.77	7.42	8.93
Fuel, lube, and electricity	18.33	19.86	20.69
Repairs	16.85	17.78	27.73
Hired labor	53.83	57.30	60.53
Ginning	43.70	35.94	42.78
Technical services	0.25	0.25	0.25
Total, variable cash expenses	276.46	283.22	313.75
General farm overhead	12.28	13.02	12.60
Taxes and insurance	11.15	11.32	16.52
Interest on operating loans	8.75	7.73	8.16
Interest on real estate	9.32	8.64	8.79
Total, fixed cash expenses	41.50	40.71	46.07
Total, cash expenses	317.96	323.93	359.82
Gross value of production less cash expenses	91.09	-43.31	37.63
Harvest-period price (dollars/lb.)	0.66	0.52	0.64
Yield (lbs./planted acre)	568.84	467.69	560.49

Table 23b--Alabama: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Cotton	377.71	242.26	356.47
Cottonseed	31.34	38.36	40.98
Total, gross value of production	409.05	280.62	397.45
Economic (full ownership) costs:			
Variable cash expenses	276.46	283.22	313.75
General farm overhead	12.28	13.02	12.60
Taxes and insurance	11.15	11.32	16.52
Capital replacement	53.62	56.78	60.19
Operating capital	9.30	10.60	14.95
Other nonland capital	8.71	10.72	19.19
Land	52.42	44.48	52.15
Unpaid labor (2.8 hrs)	12.10	12.88	13.61
Total, economic costs	436.04	443.02	502.96
Residual returns to management and risk	-26.99	-162.40	-105.51
Harvest-period price (dollars/lb.)	0.66	0.52	0.64
Yield (lbs./planted acre)	568.84	467.69	560.49

Table 24a--Arizona: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Cotton	880.37	625.28	756.67
Cottonseed	98.27	117.76	95.94
Total, gross value of production	978.64	743.04	852.61
Cash expenses:			
Seed (13.4 lbs)	7.17	7.42	7.70
Fertilizer (218.1N, 38P, 1.5K lbs)	61.59	69.21	73.75
Lime and gypsum (.01G ton)	0.08	0.08	0.08
Chemicals	122.83	124.81	130.75
Custom operations	8.72	8.70	11.98
Fuel, lube, and electricity	65.75	70.99	75.05
Repairs	37.49	39.43	43.30
Hired labor	77.75	83.78	85.79
Purchased irrigation water	23.14	23.30	24.87
Ginning	112.39	94.99	97.81
Technical services	0.72	0.72	0.72
Total, variable cash expenses	517.63	523.43	551.80
General farm overhead	79.78	84.56	81.89
Taxes and insurance	24.88	25.21	26.59
Interest on operating loans	48.79	43.11	45.50
Interest on real estate	19.51	18.09	18.40
Total, fixed cash expenses	172.96	170.97	172.38
Total, cash expenses	690.59	694.40	724.18
Gross value of production less cash expenses	288.05	48.64	128.43
Harvest-period price (dollars/lb.)	0.66	0.56	0.68
Yield (lbs./planted acre)	1,337.95	1,110.63	1,114.39

Table 24b--Arizona: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Cotton	880.37	625.28	756.67
Cottonseed	98.27	117.76	95.94
Total, gross value of production	978.64	743.04	852.61
Economic (full ownership) costs:			
Variable cash expenses	517.63	523.43	551.80
General farm overhead	79.78	84.56	81.89
Taxes and insurance	24.88	25.21	26.59
Capital replacement	108.64	114.29	122.62
Operating capital	14.26	17.28	20.89
Other nonland capital	17.73	21.73	26.02
Land	101.44	108.70	115.97
Unpaid labor (4.1 hrs)	20.66	22.26	22.80
Total, economic costs	885.02	917.46	968.58
Residual returns to management and risk	93.62	-174.42	-115.97
Harvest-period price (dollars/lb.)	0.66	0.56	0.68
Yield (lbs./planted acre)	1,337.95	1,110.63	1,114.39



Table 25a--Arkansas: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Cotton	497.93	390.80	429.91
Cottonseed	43.85	61.62	53.82
Total, gross value of production	541.78	452.42	483.73
Cash expenses:			
Seed (14.4 lbs)	8.64	7.20	8.35
Fertilizer (85.6N, 37.5P, 55.7K lbs)	28.13	33.40	35.54
Chemicals	60.73	61.71	64.65
Custom operations	8.32	7.83	8.51
Fuel, lube, and electricity	28.04	26.49	29.15
Repairs	25.39	26.71	28.56
Hired labor	49.75	49.75	51.58
Ginning	62.87	59.05	54.40
Technical services	0.52	0.52	0.52
Total, variable cash expenses	272.39	272.66	281.26
General farm overhead	23.05	24.43	23.66
Taxes and insurance	17.35	17.59	18.54
Interest on operating loans	17.50	15.46	16.32
Interest on real estate	15.73	14.58	14.83
Total, fixed cash expenses	73.63	72.06	73.35
Total, cash expenses	346.02	344.72	354.61
Gross value of production less cash expenses	195.76	107.70	129.12
Harvest-period price (dollars/lb.)	0.64	0.54	0.64
Yield (lbs./planted acre)	779.24	721.04	669.64

Table 25b--Arkansas: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Cotton	497.93	390.80	429.91
Cottonseed	43.85	61.62	53.82
Total, gross value of production	541.78	452.42	483.73
Economic (full ownership) costs:			
Variable cash expenses	272.39	272.66	281.26
General farm overhead	23.05	24.43	23.66
Taxes and insurance	17.35	17.59	18.54
Capital replacement	64.45	67.82	73.01
Operating capital	5.36	6.24	7.95
Other nonland capital	12.41	15.22	18.10
Land	111.18	96.07	102.08
Unpaid labor (4.9 hrs)	21.37	21.37	22.15
Total, economic costs	527.56	521.40	546.75
Residual returns to management and risk	14.22	-68.98	-63.02
Harvest-period price (dollars/lb.)	0.64	0.54	0.64
Yield (lbs./planted acre)	779.24	721.04	669.64

Table 26a--California: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Cotton	875.74	650.52	863.17
Cottonseed	102.16	122.22	103.17
Total, gross value of production	977.90	772.74	966.34
Cash expenses:			
Seed (16.6 lbs)	9.28	9.95	11.49
Fertilizer (147.3N, 36P, 9.3K lbs)	44.80	48.35	51.25
Lime and gypsum (.1G ton)	0.78	0.78	0.78
Chemicals	50.18	50.99	53.42
Custom operations	31.51	31.56	35.13
Fuel, lube, and electricity	69.63	71.43	76.82
Repairs	27.13	28.55	30.10
Hired labor	80.39	82.30	87.38
Purchased irrigation water	68.41	68.88	73.53
Ginning	125.92	98.99	120.79
Technical services	0.67	0.67	0.67
Total, variable cash expenses	508.70	492.45	541.36
General farm overhead	50.47	53.49	51.80
Taxes and insurance	24.08	24.47	25.52
Interest on operating loans	16.48	14.56	15.37
Interest on real estate	59.10	54.80	55.73
Total, fixed cash expenses	150.13	147.32	148.42
Total, cash expenses	658.83	639.77	689.78
Gross value of production less cash expenses	319.07	132.97	276.56
Harvest-period price (dollars/lb.)	0.70	0.65	0.71
Yield (lbs./planted acre)	1,247.50	1,003.89	1,214.02

Table 26b--California: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Cotton	875.74	650.52	863.17
Cottonseed	102.16	122.22	103.17
Total, gross value of production	977.90	772.74	966.34
Economic (full ownership) costs:			
Variable cash expenses	508.70	492.45	541.36
General farm overhead	50.47	53.49	51.80
Taxes and insurance	24.08	24.47	25.52
Capital replacement	75.19	79.13	82.70
Operating capital	12.81	15.06	18.60
Other nonland capital	11.97	14.67	16.93
Land	119.98	112.17	131.05
Unpaid labor (4.9 hrs)	30.75	31.46	33.43
Total, economic costs	833.95	822.90	901.39
Residual returns to management and risk	143.95	-50.16	64.95
Harvest-period price (dollars/lb.)	0.70	0.65	0.71
Yield (lbs./planted acre)	1,247.50	1,003.89	1,214.02

Table 27a--Georgia: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Cotton	420.53	273.50	401.42
Cottonseed	39.04	47.18	46.41
Total, gross value of production	459.57	320.68	447.83
Cash expenses:			
Seed (10.4 lbs)	5.87	6.00	5.11
Fertilizer (29.2N, 39.6P, 64.6K lbs)	20.22	24.91	24.93
Lime and gypsum (.01L ton)	0.24	0.23	0.24
Chemicals	98.59	100.18	104.95
Custom operations	11.05	8.72	8.69
Fuel, lube, and electricity	25.98	23.70	27.75
Repairs	25.00	26.31	29.06
Hired labor	32.13	34.20	36.13
Ginning	57.50	45.48	55.09
Technical services	0.23	0.23	0.23
Total, variable cash expenses	276.81	269.96	292.18
General farm overhead	14.69	15.57	15.08
Taxes and insurance	16.96	17.19	18.86
Interest on operating loans	12.31	10.88	11.48
Interest on real estate	16.94	15.71	15.97
Total, fixed cash expenses	60.90	59.35	61.39
Total, cash expenses	337.71	329.31	353.57
Gross value of production less cash expenses	121.86	-8.63	94.26
Harvest-period price (dollars/lb.)	0.65	0.54	0.65
Yield (lbs./planted acre)	648.96	507.43	619.47

Table 27b--Georgia: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Cotton	420.53	273.50	401.42
Cottonseed	39.04	47.18	46.41
Total, gross value of production	459.57	320.68	447.83
Economic (full ownership) costs:			
Variable cash expenses	276.81	269.96	292.18
General farm overhead	14.69	15.57	15.08
Taxes and insurance	16.96	17.19	18.86
Capital replacement	76.44	80.45	90.45
Operating capital	6.91	8.21	9.97
Other nonland capital	13.39	16.42	20.06
Land	38.58	43.35	47.12
Unpaid labor (5.6 hrs)	24.36	25.92	27.39
Total, economic costs	468.14	477.07	521.11
Residual returns to management and risk	-8.57	-156.39	-73.28
Harvest-period price (dollars/lb.)	0.65	0.54	0.65
Yield (lbs./planted acre)	648.96	507.43	619.47

Table 28a--Louisiana: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Cotton	506.17	326.27	417.28
Cottonseed	47.48	55.31	53.41
Total, gross value of production	553.65	381.58	470.69
Cash expenses:			
Seed (12.1 lbs)	6.73	6.54	7.61
Fertilizer (103.6N, 36.3P, 40.1K lbs)	28.93	36.12	37.79
Lime and gypsum (.07L ton)	1.16	1.13	1.13
Chemicals	84.05	85.40	89.47
Custom operations	18.78	18.13	19.34
Fuel, lube, and electricity	26.19	27.54	27.10
Repairs	24.56	25.85	27.20
Hired labor	36.52	36.52	37.86
Ginning	60.37	47.66	49.03
Technical services	0.37	0.37	0.37
Total, variable cash expenses	287.66	285.26	296.90
General farm overhead	19.73	20.91	20.25
Taxes and insurance	11.92	12.07	12.50
Interest on operating loans	14.51	12.82	13.53
Interest on real estate	14.91	13.82	14.06
Total, fixed cash expenses	61.07	59.62	60.34
Total, cash expenses	348.73	344.88	357.24
Gross value of production less cash expenses	204.92	36.70	113.45
Harvest-period price (dollars/lb.)	0.65	0.53	0.65
Yield (lbs./planted acre)	775.14	619.10	645.95

Table 28b--Louisiana: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Cotton	506.17	326.27	417.28
Cottonseed	47.48	55.31	53.41
Total, gross value of production	553.65	381.58	470.69
Economic (full ownership) costs:			
Variable cash expenses	287.66	285.26	296.90
General farm overhead	19.73	20.91	20.25
Taxes and insurance	11.92	12.07	12.50
Capital replacement	57.06	60.05	63.96
Operating capital	6.53	7.59	9.41
Other nonland capital	10.65	13.06	15.37
Land	100.89	84.52	104.75
Unpaid labor (6.4 hrs)	28.01	28.01	29.04
Total, economic costs	522.45	511.47	552.18
Residual returns to management and risk	31.20	-129.89	-81.49
Harvest-period price (dollars/lb.)	0.65	0.53	0.65
Yield (lbs./planted acre)	775.14	619.10	645.95

**Table 29a--Mississippi: Cotton production cash costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Cotton	528.02	370.34	455.97
Cottonseed	51.85	61.36	57.15
Total, gross value of production	579.87	431.70	513.12
Cash expenses:			
Seed (13.1 lbs)	7.18	7.26	7.46
Fertilizer (91.8N, 23.4P, 35.2K lbs)	24.10	30.57	33.36
Lime and gypsum (.07L ton)	1.16	1.13	1.13
Chemicals	81.24	82.55	86.48
Custom operations	13.73	12.77	12.21
Fuel, lube, and electricity	25.76	27.78	25.98
Repairs	20.45	21.52	22.81
Hired labor	46.32	46.32	48.02
Ginning	64.37	56.96	55.38
Technical services	0.45	0.45	0.45
Total, variable cash expenses	284.76	287.31	293.28
General farm overhead	23.19	24.58	23.80
Taxes and insurance	13.42	13.60	14.28
Interest on operating loans	17.65	15.60	16.46
Interest on real estate	16.16	14.98	15.24
Total, fixed cash expenses	70.42	68.76	69.78
Total, cash expenses	355.18	356.07	363.06
Gross value of production less cash expenses	224.69	75.63	150.06
Harvest-period price (dollars/lb.)	0.64	0.52	0.64
Yield (lbs./planted acre)	821.18	712.20	710.23

**Table 29b--Mississippi: Cotton production economic costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Cotton	528.02	370.34	455.97
Cottonseed	51.85	61.36	57.15
Total, gross value of production	579.87	431.70	513.12
Economic (full ownership) costs:			
Variable cash expenses	284.76	287.31	293.28
General farm overhead	23.19	24.58	23.80
Taxes and insurance	13.42	13.60	14.28
Capital replacement	55.03	57.91	62.03
Operating capital	6.43	7.41	9.23
Other nonland capital	10.26	12.58	14.87
Land	74.14	73.49	84.08
Unpaid labor (3.7 hrs)	16.12	16.12	16.71
Total, economic costs	483.35	493.00	518.28
Residual returns to management and risk	96.52	-61.30	-5.16
Harvest-period price (dollars/lb.)	0.64	0.52	0.64
Yield (lbs./planted acre)	821.18	712.20	710.23

Table 30a--Oklahoma: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Cotton	256.59	147.97	127.93
Cottonseed	31.00	21.60	24.40
Total, gross value of production	287.59	169.57	152.33
Cash expenses:			
Seed (16.9 lbs)	7.42	5.74	5.69
Fertilizer (20.7N, 13.9P, 2.5K lbs)	6.02	7.18	7.84
Chemicals	11.96	12.15	12.73
Custom operations	4.51	4.33	4.21
Fuel, lube, and electricity	16.98	17.67	19.55
Repairs	11.80	12.69	13.17
Hired labor	13.02	13.04	13.58
Purchased irrigation water	0.64	0.64	0.69
Ginning	43.74	31.44	21.30
Technical services	5.70	5.70	5.70
Total, variable cash expenses	121.79	110.58	104.46
General farm overhead	12.95	13.73	13.29
Taxes and insurance	8.02	8.26	8.25
Interest on operating loans	9.90	8.75	9.23
Interest on real estate	13.96	12.94	13.16
Total, fixed cash expenses	44.83	43.68	43.93
Total, cash expenses	166.62	154.26	148.39
Gross value of production less cash expenses	120.97	15.31	3.94
Harvest-period price (dollars/lb.)	0.62	0.47	0.57
Yield (lbs./planted acre)	415.20	316.17	224.43

Table 30b--Oklahoma: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Cotton	256.59	147.97	127.93
Cottonseed	31.00	21.60	24.40
Total, gross value of production	287.59	169.57	152.33
Economic (full ownership) costs:			
Variable cash expenses	121.79	110.58	104.46
General farm overhead	12.95	13.73	13.29
Taxes and insurance	8.02	8.26	8.25
Capital replacement	29.93	32.41	30.60
Operating capital	2.85	3.16	3.96
Other nonland capital	4.79	6.02	6.57
Land	66.13	41.72	39.45
Unpaid labor (3.4 hrs)	17.68	17.71	18.44
Total, economic costs	264.14	233.59	225.02
Residual returns to management and risk	23.45	-64.02	-72.69
Harvest-period price (dollars/lb.)	0.62	0.47	0.57
Yield (lbs./planted acre)	415.20	316.17	224.43

Table 31a--Tennessee: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Cotton	443.34	269.84	314.46
Cottonseed	41.66	48.73	38.61
Total, gross value of production	485.00	318.57	353.07
Cash expenses:			
Seed (15 lbs)	8.76	8.04	8.75
Fertilizer (78.1N, 59.3P, 70K lbs)	34.17	41.62	45.00
Chemicals	37.13	37.73	39.52
Custom operations	5.73	5.76	7.81
Fuel, lube, and electricity	22.24	25.71	24.19
Repairs	32.13	54.92	35.22
Hired labor	22.78	25.47	26.53
Ginning	50.17	38.25	35.40
Technical services	1.83	1.83	1.83
Total, variable cash expenses	214.94	239.33	224.25
General farm overhead	12.36	13.10	12.69
Taxes and insurance	13.18	18.00	13.86
Interest on operating loans	10.63	9.39	9.91
Interest on real estate	21.19	19.65	19.98
Total, fixed cash expenses	57.36	60.14	56.44
Total, cash expenses	272.30	299.47	280.69
Gross value of production less cash expenses	212.70	19.10	72.38
Harvest-period price (dollars/lb.)	0.64	0.51	0.64
Yield (lbs./planted acre)	691.64	523.96	491.35

Table 31b--Tennessee: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Cotton	443.34	269.84	314.46
Cottonseed	41.66	48.73	38.61
Total, gross value of production	485.00	318.57	353.07
Economic (full ownership) costs:			
Variable cash expenses	214.94	239.33	224.25
General farm overhead	12.36	13.10	12.69
Taxes and insurance	13.18	18.00	13.86
Capital replacement	66.25	101.50	75.14
Operating capital	4.07	6.81	6.53
Other nonland capital	11.25	19.43	16.33
Land	93.77	71.88	78.55
Unpaid labor (4.7 hrs)	20.38	22.79	23.73
Total, economic costs	436.20	492.84	451.08
Residual returns to management and risk	48.80	-174.27	-98.01
Harvest-period price (dollars/lb.)	0.64	0.51	0.64
Yield (lbs./planted acre)	691.64	523.96	491.35

Table 32a--Texas: Cotton production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Cotton	298.50	212.08	188.91
Cottonseed	32.37	43.81	31.66
Total, gross value of production	330.87	255.89	220.57
Cash expenses:			
Seed (20.3 lbs)	8.53	9.74	8.57
Fertilizer (36.6N, 27.3P, 3.2K lbs)	11.57	13.15	14.78
Chemicals	18.90	19.20	20.12
Custom operations	7.97	8.11	7.01
Fuel, lube, and electricity	25.17	26.39	27.37
Repairs	17.42	18.34	18.95
Hired labor	28.84	28.90	30.08
Purchased irrigation water	0.46	0.46	0.49
Ginning	53.25	48.13	32.65
Technical services	2.13	2.13	2.13
Total, variable cash expenses	174.24	174.55	162.15
General farm overhead	12.25	12.98	12.57
Taxes and insurance	11.56	11.73	12.13
Interest on operating loans	13.70	12.11	12.78
Interest on real estate	11.09	10.28	10.46
Total, fixed cash expenses	48.60	47.10	47.94
Total, cash expenses	222.84	221.65	210.09
Gross value of production less cash expenses	108.03	34.24	10.48
Harvest-period price (dollars/lb.)	0.63	0.47	0.62
Yield (lbs./planted acre)	475.32	449.33	304.21

Table 32b--Texas: Cotton production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Cotton	298.50	212.08	188.91
Cottonseed	32.37	43.81	31.66
Total, gross value of production	330.87	255.89	220.57
Economic (full ownership) costs:			
Variable cash expenses	174.24	174.55	162.15
General farm overhead	12.25	12.98	12.57
Taxes and insurance	11.56	11.73	12.13
Capital replacement	44.77	47.11	50.48
Operating capital	4.04	4.59	5.76
Other nonland capital	7.44	9.12	10.67
Land	75.55	58.40	50.69
Unpaid labor (4 hrs)	20.33	20.37	21.20
Total, economic costs	350.18	338.85	325.65
Residual returns to management and risk	-19.31	-82.96	-105.08
Harvest-period price (dollars/lb.)	0.63	0.47	0.62
Yield (lbs./planted acre)	475.32	449.33	304.21



Table 33a--Michigan: Oats production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Oats			
Oats straw	82.08	81.30	99.83
Total, gross value of production	4.72	7.86	4.19
	86.80	89.16	104.02
Cash expenses:			
Seed (90.1 lbs)	8.11	9.73	10.72
Fertilizer (30.2N, 53.6P, 66.4K lbs)	24.21	29.26	29.51
Lime and gypsum (.1L ton)	1.27	1.29	1.19
Chemicals	1.60	1.63	1.71
Custom operations	2.57	2.59	2.77
Fuel, lube, and electricity	8.17	8.23	8.73
Repairs	6.09	6.37	7.22
Hired labor	4.16	4.28	4.48
Total, variable cash expenses	56.18	63.38	66.33
General farm overhead	4.05	4.07	3.95
Taxes and insurance	22.91	23.25	23.50
Interest on operating loans	1.16	1.15	1.23
Interest on real estate	3.39	3.61	3.63
Total, fixed cash expenses	31.51	32.08	32.31
Total, cash expenses	87.69	95.46	98.64
Gross value of production less cash expenses	-0.89	-6.30	5.38
Harvest-period price (dollars/bu.)	1.44	2.71	1.49
Yield (bu./planted acre)	57.00	30.00	67.00

Table 33b--Michigan: Oats production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Oats			
Oats straw	82.08	81.30	99.83
Total, gross value of production	4.72	7.86	4.19
	86.80	89.16	104.02
Economic (full ownership) costs:			
Variable cash expenses	56.18	63.38	66.33
General farm overhead	4.05	4.07	3.95
Taxes and insurance	22.91	23.25	23.50
Capital replacement	26.51	27.81	31.51
Operating capital	0.84	1.09	1.31
Other nonland capital	5.02	6.12	7.68
Land	3.24	2.13	5.20
Unpaid labor (3.4 hrs)	15.88	16.36	17.10
Total, economic costs	134.63	144.21	156.58
Residual returns to management and risk	-47.83	-55.05	-52.56
Harvest-period price (dollars/bu.)	1.44	2.71	1.49
Yield (bu./planted acre)	57.00	30.00	67.00

Table 34a--Minnesota: Oats production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Oats	78.66	87.45	96.25
Oats straw	8.81	13.30	10.19
Total, gross value of production	87.47	100.75	106.44
Cash expenses:			
Seed (91.2 lbs)	6.57	7.93	9.30
Fertilizer (13.5N, 12.9P, 18.6K lbs)	10.83	12.31	12.46
Chemicals	1.20	1.22	1.28
Custom operations	2.76	2.78	2.97
Fuel, lube, and electricity	6.95	6.52	7.49
Repairs	5.89	6.15	6.95
Hired labor	2.24	2.30	2.41
Total, variable cash expenses	36.44	39.21	42.86
General farm overhead	2.46	2.47	2.40
Taxes and insurance	10.95	11.07	11.28
Interest on operating loans	0.92	0.92	0.98
Interest on real estate	2.15	2.29	2.30
Total, fixed cash expenses	16.48	16.75	16.96
Total, cash expenses	52.92	55.96	59.82
Gross value of production less cash expenses	34.55	44.79	46.62
Harvest-period price (dollars/bu.)	1.38	2.65	1.75
Yield (bu./planted acre)	57.00	33.00	55.00

Table 34b--Minnesota: Oats production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Oats	78.66	87.45	96.25
Oats straw	8.81	13.30	10.19
Total, gross value of production	87.47	100.75	106.44
Economic (full ownership) costs:			
Variable cash expenses	36.44	39.21	42.86
General farm overhead	2.46	2.47	2.40
Taxes and insurance	10.95	11.07	11.28
Capital replacement	24.89	26.11	29.54
Operating capital	0.51	0.63	0.79
Other nonland capital	4.89	5.95	7.44
Land	25.49	28.63	33.18
Unpaid labor (3.1 hrs)	14.50	14.93	15.61
Total, economic costs	120.13	129.00	143.10
Residual returns to management and risk	-32.66	-28.25	-36.66
Harvest-period price (dollars/bu.)	1.38	2.65	1.75
Yield (bu./planted acre)	57.00	33.00	55.00

Table 35a--New York: Oats production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Oats	72.00	105.56	71.98
Oats straw	32.70	32.70	35.08
Total, gross value of production	104.70	138.26	107.06
Cash expenses:			
Seed (111.5 lbs)	12.82	15.28	15.61
Fertilizer (34.1N, 50.8P, 50.6K lbs)	22.50	27.33	30.27
Lime and gypsum (.51 ton)	12.15	11.15	12.10
Chemicals	3.56	3.62	3.79
Custom operations	8.31	8.37	8.94
Fuel, lube, and electricity	9.36	9.91	10.63
Repairs	7.91	8.33	9.43
Hired labor	4.10	4.49	4.69
Total, variable cash expenses	80.71	88.48	95.46
General farm overhead	8.42	8.45	8.20
Taxes and insurance	22.83	23.19	23.38
Interest on operating loans	1.05	1.04	1.11
Interest on real estate	2.84	3.03	3.04
Total, fixed cash expenses	35.14	35.71	35.73
Total, cash expenses	115.85	124.19	131.19
Gross value of production less cash expenses	-11.15	14.07	-24.13
Harvest-period price (dollars/bu.)	1.20	2.03	1.22
Yield (bu./planted acre)	60.00	52.00	59.00

Table 35b--New York: Oats production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Oats	72.00	105.56	71.98
Oats straw	32.70	32.70	35.08
Total, gross value of production	104.70	138.26	107.06
Economic (full ownership) costs:			
Variable cash expenses	80.71	88.48	95.46
General farm overhead	8.42	8.45	8.20
Taxes and insurance	22.83	23.19	23.38
Capital replacement	33.50	35.25	39.99
Operating capital	1.15	1.45	1.80
Other nonland capital	5.83	7.15	8.84
Land	1.62	3.48	3.38
Unpaid labor (2 hrs)	9.91	10.86	11.34
Total, economic costs	163.97	178.31	192.39
Residual returns to management and risk	-59.27	-40.05	-85.33
Harvest-period price (dollars/bu.)	1.20	2.03	1.22
Yield (bu./planted acre)	60.00	52.00	59.00

Table 36a--North Dakota: Oats production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Oats	68.12	39.96	37.20
Oats straw	0.15	0.30	0.31
Total, gross value of production	68.27	40.26	37.51
Cash expenses:			
Seed (70 lbs)	3.99	4.83	5.74
Fertilizer (18.5N, 21.4P, .5K lbs)	9.54	10.27	10.43
Chemicals	0.53	0.54	0.57
Custom operations	0.59	0.59	0.63
Fuel, lube, and electricity	4.00	3.81	4.41
Repairs	5.11	5.26	5.89
Hired labor	14.49	15.57	17.19
Total, variable cash expenses	38.25	40.87	44.86
General farm overhead	1.70	1.70	1.65
Taxes and insurance	4.99	5.18	5.24
Interest on operating loans	0.61	0.60	0.64
Interest on real estate	1.35	1.44	1.45
Total, fixed cash expenses	8.65	8.92	8.98
Total, cash expenses	46.90	49.79	53.84
Gross value of production less cash expenses	21.37	-9.53	-16.33
Harvest-period price (dollars/bu.)	1.31	2.22	1.20
Yield (bu./planted acre)	52.00	18.00	31.00

Table 36b--North Dakota: Oats production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Oats	68.12	39.96	37.20
Oats straw	0.15	0.30	0.31
Total, gross value of production	68.27	40.26	37.51
Economic (full ownership) costs:			
Variable cash expenses	38.25	40.87	44.86
General farm overhead	1.70	1.70	1.65
Taxes and insurance	4.99	5.18	5.24
Capital replacement	16.26	16.96	18.40
Operating capital	0.59	0.73	0.92
Other nonland capital	2.91	3.50	4.30
Land	18.00	13.76	13.54
Unpaid labor (1.3 hrs)	6.09	6.56	7.25
Total, economic costs	88.79	89.26	96.16
Residual returns to management and risk	-20.52	-49.00	-58.65
Harvest-period price (dollars/bu.)	1.31	2.22	1.20
Yield (bu./planted acre)	52.00	18.00	31.00

Table 37a--Pennsylvania: Oats production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Oats	75.24	121.50	83.70
Oats straw	33.37	39.65	34.82
Total, gross value of production	108.61	161.15	118.52
Cash expenses:			
Seed (92.5 lbs)	9.80	11.65	12.30
Fertilizer (25.8N, 41.2P, 41.1K lbs)	24.62	28.53	30.14
Lime and gypsum (.2L ton)	4.86	4.46	4.84
Chemicals	1.79	1.82	1.91
Custom operations	1.76	1.77	1.89
Fuel, lube, and electricity	8.40	8.37	9.78
Repairs	10.89	11.46	12.68
Hired labor	3.71	4.43	4.61
Total, variable cash expenses	65.83	72.49	78.15
General farm overhead	8.57	8.60	8.35
Taxes and insurance	11.30	11.46	11.64
Interest on operating loans	0.98	0.97	1.04
Interest on real estate	3.38	3.60	3.62
Total, fixed cash expenses	24.23	24.63	24.65
Total, cash expenses	90.06	97.12	102.80
Gross value of production less cash expenses	18.55	64.03	15.72
Harvest-period price (dollars/bu.)	1.32	2.43	1.55
Yield (bu./planted acre)	57.00	50.00	54.00

Table 37b--Pennsylvania: Oats production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Oats	75.24	121.50	83.70
Oats straw	33.37	39.65	34.82
Total, gross value of production	108.61	161.15	118.52
Economic (full ownership) costs:			
Variable cash expenses	65.83	72.49	78.15
General farm overhead	8.57	8.60	8.35
Taxes and insurance	11.30	11.46	11.64
Capital replacement	32.12	33.81	38.44
Operating capital	1.42	1.82	2.25
Other nonland capital	5.71	7.00	8.65
Land	14.94	16.31	18.12
Unpaid labor (4.1 hrs)	18.62	22.27	23.17
Total, economic costs	158.51	173.76	188.77
Residual returns to management and risk	-49.90	-12.61	-70.25
Harvest-period price (dollars/bu.)	1.32	2.43	1.55
Yield (bu./planted acre)	57.00	50.00	54.00

Table 38a--Wisconsin: Oats production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Oats	63.72	83.64	89.10
Oats straw	12.45	22.14	18.82
Total, gross value of production	76.17	105.78	107.92
Cash expenses:			
Seed (96.2 lbs)	7.12	8.66	10.10
Fertilizer (6.5N, 21.1P, 51.4K lbs)	16.41	19.06	19.56
Lime and gypsum (.3L ton)	3.81	3.87	3.57
Chemicals	0.39	0.40	0.42
Custom operations	5.16	5.19	5.54
Fuel, lube, and electricity	6.46	6.60	7.28
Repairs	5.14	5.36	6.08
Hired labor	9.73	10.02	10.48
Total, variable cash expenses	54.22	59.16	63.03
General farm overhead	3.61	3.63	3.52
Taxes and insurance	19.86	20.16	20.30
Interest on operating loans	1.04	1.03	1.10
Interest on real estate	1.98	2.11	2.12
Total, fixed cash expenses	26.49	26.93	27.04
Total, cash expenses	80.71	86.09	90.07
Gross value of production less cash expenses	-4.54	19.69	17.85
Harvest-period price (dollars/bu.)	1.18	2.46	1.35
Yield (bu./planted acre)	54.00	34.00	66.00

Table 38b--Wisconsin: Oats production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Oats	63.72	83.64	89.10
Oats straw	12.45	22.14	18.82
Total, gross value of production	76.17	105.78	107.92
Economic (full ownership) costs:			
Variable cash expenses	54.22	59.16	63.03
General farm overhead	3.61	3.63	3.52
Taxes and insurance	19.86	20.16	20.30
Capital replacement	18.27	19.14	21.44
Operating capital	1.12	1.40	1.71
Other nonland capital	3.55	4.32	5.37
Land	20.47	21.22	25.65
Unpaid labor (3.5 hrs)	16.63	17.13	17.91
Total, economic costs	137.73	146.16	158.93
Residual returns to management and risk	-61.56	-40.38	-51.01
Harvest-period price (dollars/bu.)	1.18	2.46	1.35
Yield (bu./planted acre)	54.00	34.00	66.00

Table 39a--Alabama: Peanut production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Peanuts	604.25	716.55	645.78
Peanut hay	11.74	15.95	12.96
Total, gross value of production	615.99	732.50	658.74
Cash expenses:			
Seed (95.4 lbs)	79.87	69.18	69.37
Fertilizer (12.8N, 40.3P, 56.8K lbs)	16.75	21.25	22.49
Lime and gypsum (.29L, .04G ton)	5.89	5.87	5.81
Chemicals	74.64	75.84	79.45
Custom operations	3.22	3.41	3.56
Fuel, lube, and electricity	22.68	25.42	25.95
Repairs	15.38	16.27	17.16
Hired labor	29.96	31.89	33.70
Drying	26.94	30.30	29.27
Technical services	1.50	1.50	1.50
Total, variable cash expenses	276.83	280.93	288.26
General farm overhead	25.11	22.61	21.95
Taxes and insurance	9.80	9.98	10.22
Interest on operating loans	10.24	9.05	9.10
Interest on real estate	34.13	31.65	33.77
Total, fixed cash expenses	79.28	73.29	75.04
Total, cash expenses	356.11	354.22	363.30
Gross value of production less cash expenses	259.88	378.28	295.44
Harvest-period price (dollars/lb.)	0.29	0.29	0.28
Yield (lbs./planted acre)	2,105.40	2,429.00	2,290.00

Table 39b--Alabama: Peanut production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Peanuts	604.25	716.55	645.78
Peanut hay	11.74	15.95	12.96
Total, gross value of production	615.99	732.50	658.74
Economic (full ownership) costs:			
Variable cash expenses	276.83	280.93	288.26
General farm overhead	25.11	22.61	21.95
Taxes and insurance	9.80	9.98	10.22
Capital replacement	42.20	44.66	46.57
Operating capital	6.03	6.87	8.23
Other nonland capital	8.05	9.94	11.51
Land	73.43	80.73	75.43
Peanut quota	96.86	98.10	98.19
Unpaid labor (8.6 hrs)	37.28	39.69	41.92
Total, economic costs	575.59	593.51	602.28
Residual returns to management and risk	40.40	138.99	56.46
Harvest-period price (dollars/lb.)	0.29	0.29	0.28
Yield (lbs./planted acre)	2,105.40	2,429.00	2,290.00

Table 40a--Georgia: Peanut production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Peanuts	701.92	731.42	707.52
Peanut hay	10.86	14.76	12.00
Total, gross value of production	712.78	746.18	719.52
Cash expenses:			
Seed (105.8 lbs)	89.29	77.65	76.49
Fertilizer (10.9N, 45.5P, 67.6K lbs)	18.47	22.63	22.26
Lime and gypsum (.2L, .26G ton)	13.19	13.92	14.10
Chemicals	77.44	78.69	82.43
Custom operations	10.19	10.41	10.88
Fuel, lube, and electricity	38.90	36.09	41.01
Repairs	19.53	20.68	21.64
Hired labor	30.83	32.82	29.48
Drying	19.56	20.64	21.28
Technical services	0.48	0.48	0.48
Total, variable cash expenses	317.88	314.01	320.05
General farm overhead	38.12	40.40	39.21
Taxes and insurance	14.11	14.39	15.06
Interest on operating loans	24.53	21.67	21.80
Interest on real estate	41.43	38.41	40.99
Total, fixed cash expenses	118.19	114.87	117.06
Total, cash expenses	436.07	428.88	437.11
Gross value of production less cash expenses	276.71	317.30	282.41
Harvest-period price (dollars/lb.)	0.28	0.28	0.26
Yield (lbs./planted acre)	2,480.30	2,631.00	2,680.00

Table 40b--Georgia: Peanut production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Peanuts	701.92	731.42	707.52
Peanut hay	10.86	14.76	12.00
Total, gross value of production	712.78	746.18	719.52
Economic (full ownership) costs:			
Variable cash expenses	317.88	314.01	320.05
General farm overhead	38.12	40.40	39.21
Taxes and insurance	14.11	14.39	15.06
Capital replacement	51.49	54.46	56.74
Operating capital	8.47	9.54	11.18
Other nonland capital	9.97	12.30	14.23
Land	42.10	47.68	44.89
Peanut quota	134.20	135.92	136.05
Unpaid labor (7.3 hrs)	31.85	33.91	35.81
Total, economic costs	648.19	662.61	673.22
Residual returns to management and risk	64.59	83.57	46.30
Harvest-period price (dollars/lb.)	0.28	0.28	0.26
Yield (lbs./planted acre)	2,480.30	2,631.00	2,680.00



Table 41a--North Carolina: Peanut production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production			
Peanuts	739.96	768.34	735.26
Peanut hay	12.02	16.33	13.27
Total, gross value of production	751.98	784.67	748.53
Cash expenses:			
Seed (103.9 lbs)	87.92	103.09	88.54
Fertilizer (5.4N, 17.6P, 50.4K lbs)	9.71	12.20	13.04
Lime and gypsum (.32L, .62G ton)	22.71	22.55	22.84
Chemicals	74.87	76.08	79.70
Custom operations	8.87	9.13	10.49
Fuel, lube, and electricity	31.96	33.62	34.16
Repairs	18.20	19.37	19.73
Hired labor	43.27	43.27	44.63
Drying	30.49	31.48	29.16
Technical services	1.38	1.38	1.38
Total, variable cash expenses	329.38	352.17	343.67
General farm overhead	47.60	50.45	48.97
Taxes and insurance	17.54	17.83	18.01
Interest on operating loans	16.53	14.61	14.69
Interest on real estate	28.53	26.45	28.22
Total, fixed cash expenses	110.20	109.34	109.89
Total, cash expenses	439.58	461.51	453.56
Gross value of production less cash expenses	312.40	323.16	294.97
Harvest-period price (dollars/lb.)	0.28	0.28	0.30
Yield (lbs./planted acre)	2,614.70	2,715.00	2,484.00

Table 41b--North Carolina: Peanut production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production			
Peanuts	739.96	768.34	735.26
Peanut hay	12.02	16.33	13.27
Total, gross value of production	751.98	784.67	748.53
Economic (full ownership) costs:			
Variable cash expenses	329.38	352.17	343.67
General farm overhead	47.60	50.45	48.97
Taxes and insurance	17.54	17.83	18.01
Capital replacement	55.40	58.59	60.74
Operating capital	6.73	8.22	9.30
Other nonland capital	11.75	14.50	16.64
Land	75.85	77.05	86.59
Peanut quota	100.70	101.90	102.00
Unpaid labor (7.6 hrs)	38.33	38.33	37.16
Total, economic costs	683.28	719.04	723.08
Residual returns to management and risk	68.70	65.63	25.45
Harvest-period price (dollars/lb.)	0.28	0.28	0.30
Yield (lbs./planted acre)	2,614.70	2,715.00	2,484.00

Table 42a--Oklahoma: Peanut production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Peanuts	516.20	657.72	701.84
Peanut hay	19.50	20.12	18.64
Total, gross value of production	535.70	677.84	720.48
Cash expenses:			
Seed (75.5 lbs)	64.18	54.59	53.99
Fertilizer (23.9N, 59.2P, 54.8K lbs)	21.22	25.67	27.23
Lime and gypsum (.08L, .03G ton)	2.22	2.01	2.14
Chemicals	48.64	49.42	51.78
Custom operations	9.99	10.16	10.07
Fuel, lube, and electricity	37.42	37.86	44.03
Repairs	24.96	26.19	28.44
Hired labor	33.49	33.56	37.70
Drying	32.92	33.47	36.79
Technical services	0.37	0.37	0.37
Total, variable cash expenses	275.41	273.30	292.54
General farm overhead	25.57	27.10	26.30
Taxes and insurance	13.05	13.17	13.82
Interest on operating loans	30.75	27.17	27.33
Interest on real estate	37.39	34.67	37.00
Total, fixed cash expenses	106.76	102.11	104.45
Total, cash expenses	382.17	375.41	396.99
Gross value of production less cash expenses	153.53	302.43	323.49
Harvest-period price (dollars/lb.)	0.23	0.28	0.28
Yield (lbs./planted acre)	2,225.00	2,349.00	2,480.00

Table 42b--Oklahoma: Peanut production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Peanuts	516.20	657.72	701.84
Peanut hay	19.50	20.12	18.64
Total, gross value of production	535.70	677.84	720.48
Economic (full ownership) costs:			
Variable cash expenses	275.41	273.30	292.54
General farm overhead	25.57	27.10	26.30
Taxes and insurance	13.05	13.17	13.82
Capital replacement	54.30	56.95	61.01
Operating capital	5.93	6.67	8.17
Other nonland capital	11.35	13.86	16.78
Land	86.54	104.02	109.18
Peanut quota	126.50	128.12	128.24
Unpaid labor (8.9 hrs)	45.78	45.87	47.74
Total, economic costs	644.43	669.06	703.78
Residual returns to management and risk	-108.73	8.78	16.70
Harvest-period price (dollars/lb.)	0.23	0.28	0.28
Yield (lbs./planted acre)	2,225.00	2,349.00	2,480.00

Table 43a--Texas: Peanut production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Peanuts	496.55	444.36	513.64
Peanut hay	7.27	7.51	6.46
Total, gross value of production	503.82	451.87	520.10
Cash expenses:			
Seed (66.2 lbs)	54.77	47.83	46.50
Fertilizer (31.1N, 30.5P, 21.6K lbs)	13.17	15.37	17.02
Chemicals	39.12	39.75	41.64
Custom operations	7.04	6.89	7.53
Fuel, tube, and electricity	32.77	33.59	35.37
Repairs	19.83	20.67	21.93
Hired labor	28.73	28.79	29.96
Drying	25.90	24.26	27.26
Technical services	0.72	0.72	0.72
Total, variable cash expenses	222.05	217.87	227.93
General farm overhead	18.27	19.36	18.79
Taxes and insurance	10.65	10.63	10.58
Interest on operating loans	20.57	18.18	18.29
Interest on real estate	10.39	9.63	10.28
Total, fixed cash expenses	59.88	57.80	57.94
Total, cash expenses	281.93	275.67	285.87
Gross value of production less cash expenses	221.89	176.20	234.23
Harvest-period price (dollars/lb.)	0.29	0.28	0.28
Yield (lbs./planted acre)	1,736.20	1,587.00	1,815.00

Table 43b--Texas: Peanut production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Peanuts	496.55	444.36	513.64
Peanut hay	7.27	7.51	6.46
Total, gross value of production	503.82	451.87	520.10
Economic (full ownership) costs:			
Variable cash expenses	222.05	217.87	227.93
General farm overhead	18.27	19.36	18.79
Taxes and insurance	10.65	10.63	10.58
Capital replacement	43.15	44.76	47.65
Operating capital	4.93	5.57	6.63
Other nonland capital	8.62	10.40	12.30
Land	80.56	73.51	85.22
Peanut quota	79.11	80.12	80.20
Unpaid labor (9.7 hrs)	49.67	49.77	51.80
Total, economic costs	517.01	511.99	541.10
Residual returns to management and risk	-13.19	-60.12	-21.00
Harvest-period price (dollars/lb.)	0.29	0.28	0.28
Yield (lbs./planted acre)	1,736.20	1,587.00	1,815.00

Table 44a--Virginia: Peanut production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Peanuts	726.32	842.63	805.50
Peanut hay	9.18	12.48	10.07
Total, gross value of production	735.50	855.11	815.57
Cash expenses:			
Seed (101.4 lbs)	84.33	98.42	86.16
Fertilizer (6.6N, 20.2P, 37.5K lbs)	9.12	11.37	12.25
Lime and gypsum (.22L, .46G ton)	16.25	16.14	16.34
Chemicals	110.58	112.36	117.71
Custom operations	5.97	6.12	6.62
Fuel, lube, and electricity	46.16	47.31	45.50
Repairs	20.26	21.46	21.16
Hired labor	36.25	39.70	36.18
Drying	11.41	12.25	10.98
Technical services	0.39	0.39	0.39
Total, variable cash expenses	340.72	365.52	353.29
General farm overhead	24.25	25.70	24.94
Taxes and insurance	17.54	17.83	17.77
Interest on operating loans	20.59	18.19	18.30
Interest on real estate	10.36	9.61	10.25
Total, fixed cash expenses	72.74	71.33	71.26
Total, cash expenses	413.46	436.85	424.55
Gross value of production less cash expenses	322.04	418.26	391.02
Harvest-period price (dollars/lb.)	0.27	0.28	0.30
Yield (lbs./planted acre)	2,670.30	2,967.00	2,641.00

Table 44b--Virginia: Peanut production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Peanuts	726.32	842.63	805.50
Peanut hay	9.18	12.48	10.07
Total, gross value of production	735.50	855.11	815.57
Economic (full ownership) costs:			
Variable cash expenses	340.72	365.52	353.29
General farm overhead	24.25	25.70	24.94
Taxes and insurance	17.54	17.83	17.77
Capital replacement	58.58	61.99	63.39
Operating capital	8.58	10.51	11.86
Other nonland capital	12.48	15.40	17.30
Land	87.80	92.40	93.15
Peanut quota	115.20	116.74	116.85
Unpaid labor (9.2 hrs)	40.08	43.90	45.28
Total, economic costs	705.23	769.99	763.83
Residual returns to management and risk	30.27	105.12	71.74
Harvest-period price (dollars/lb.)	0.27	0.28	0.30
Yield (lbs./planted acre)	2,670.30	2,967.00	2,641.00

Table 45a--Arkansas (non-Delta): Rice production cash costs and returns per planted acre, 1988-89

Item	1988	1989
<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):		
Rice	370.69	420.14
Total, gross value of production	370.69	420.14
Cash expenses:		
Seed (126.5 lbs)	19.06	19.46
Fertilizer (132.1N, 8.7P, 23.8K lbs)	32.06	34.68
Chemicals	32.41	33.69
Custom operations	25.16	26.82
Fuel, lube, and electricity	58.97	62.55
Repairs	28.73	30.40
Hired labor	32.40	33.60
Drying	32.63	34.90
Miscellaneous	1.33	1.37
Technical services	0.15	0.16
Total, variable cash expenses	262.90	277.63
General farm overhead	18.35	17.81
Taxes and insurance	12.69	13.10
Interest on operating loans	11.33	11.40
Interest on real estate	15.00	16.00
Total, fixed cash expenses	57.37	58.31
Total, cash expenses	320.27	335.94
Gross value of production less cash expenses	50.42	84.20
Harvest-month price (dollars/cwt.)	6.93	7.52
Yield (cwt./planted acre)	53.49	55.87

Table 45b--Arkansas (non-Delta): Rice production economic costs and returns per planted acre, 1988-89

Item	1988	1989
<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):		
Rice	370.69	420.14
Total, gross value of production	370.69	420.14
Economic (full ownership) costs:		
Variable cash expenses	262.90	277.63
General farm overhead	18.35	17.81
Taxes and insurance	12.69	13.10
Capital replacement	45.50	47.81
Operating capital	9.10	11.16
Other nonland capital	17.85	21.53
Land	58.62	69.63
Unpaid labor (3.9 hrs)	16.87	17.48
Total, economic costs	441.88	476.17
Residual returns to management and risk	-71.19	-56.01
Harvest-month price (dollars/cwt.)	6.93	7.52
Yield (cwt./planted acre)	53.49	55.87

Table 46a--California: Rice production cash costs and returns per planted acre, 1988-89

Item	1988	1989
<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):		
Rice	412.87	515.91
Total, gross value of production	412.87	515.91
Cash expenses:		
Seed (168.7 lbs)	22.01	22.06
Fertilizer (101.8N, 39.1P, 5.1K lbs)	38.63	41.07
Chemicals	48.74	50.66
Custom operations	48.23	51.42
Fuel, lube, and electricity	54.85	59.08
Repairs	21.64	23.59
Hired labor	40.36	42.86
Purchased irrigation water	21.64	23.59
Drying	48.03	55.59
Miscellaneous	1.41	1.46
Technical services	1.15	1.25
Total, variable cash expenses	346.49	371.84
General farm overhead	37.92	36.81
Taxes and insurance	16.80	17.66
Interest on operating loans	18.68	18.79
Interest on real estate	25.76	27.48
Total, fixed cash expenses	99.16	100.74
Total, cash expenses	445.65	472.58
Gross value of production less cash expenses	-32.78	43.33
Harvest-month price (dollars/cwt.)	5.95	6.61
Yield (cwt./planted acre)	69.39	78.05

Table 46b--California: Rice production economic costs and returns per planted acre, 1988-89

Item	1988	1989
<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):		
Rice	412.87	515.91
Total, gross value of production	412.87	515.91
Economic (full ownership) costs:		
Variable cash expenses	346.49	371.84
General farm overhead	37.92	36.81
Taxes and insurance	16.80	17.66
Capital replacement	38.83	41.21
Operating capital	11.99	14.95
Other nonland capital	15.89	19.24
Land	114.12	135.18
Unpaid labor (7.3 hrs)	46.99	49.90
Total, economic costs	629.03	686.79
Residual returns to management and risk	-216.16	-170.88
Harvest-month price (dollars/cwt.)	5.95	6.61
Yield (cwt./planted acre)	69.39	78.05

Table 47a--Southwest Louisiana: Rice production cash costs and returns per planted acre, 1988-89

Item	1988	1989
	Dollars	
Gross value of production (excl. direct Gov't. payments):		
Rice	305.68	318.94
Total, gross value of production	305.68	318.94
Cash expenses:		
Seed (136.8 lbs)	28.22	28.28
Fertilizer (107.4N, 47P, 44.6K lbs)	40.54	42.15
Chemicals	32.50	33.78
Custom operations	29.11	31.04
Fuel, lube, and electricity	47.46	47.17
Repairs	19.28	20.43
Hired labor	17.27	17.91
Purchased irrigation water	0.34	0.37
Drying	42.53	39.77
Miscellaneous	0.24	0.24
Technical services	0.14	0.15
Total, variable cash expenses	257.63	261.29
General farm overhead	16.32	15.84
Taxes and insurance	7.58	7.71
Interest on operating loans	13.78	13.86
Interest on real estate	4.75	5.07
Total, fixed cash expenses	42.43	42.48
Total, cash expenses	300.06	303.77
Gross value of production less cash expenses	5.62	15.17
Harvest-month price (dollars/cwt.)	6.96	7.54
Yield (cwt./planted acre)	43.92	42.30

Table 47b--Southwest Louisiana: Rice production economic costs and returns per planted acre, 1988-89

Item	1988	1989
	Dollars	
Gross value of production (excl. direct Gov't. payments):		
Rice	305.68	318.94
Total, gross value of production	305.68	318.94
Economic (full ownership) costs:		
Variable cash expenses	257.63	261.29
General farm overhead	16.32	15.84
Taxes and insurance	7.58	7.71
Capital replacement	33.50	35.23
Operating capital	8.91	10.50
Other nonland capital	14.95	17.99
Land	50.04	55.65
Unpaid labor (6.6 hrs)	28.74	29.79
Total, economic costs	417.67	434.00
Residual returns to management and risk	-111.99	-115.06
Harvest-month price (dollars/cwt.)	6.96	7.54
Yield (cwt./planted acre)	43.92	42.30

Table 48a--Mississippi (Delta): Rice production cash costs and returns per planted acre, 1988-89

Item	1988	1989
Dollars		
Gross value of production (excl. direct Gov't. payments):		
Rice	351.65	399.69
Total, gross value of production	351.65	399.69
Cash expenses:		
Seed (118.1 lbs)	20.76	20.82
Fertilizer (151N, 2.6P, .7K lbs)	31.47	34.35
Chemicals	46.10	47.92
Custom operations	37.07	39.52
Fuel, lube, and electricity	53.53	56.07
Repairs	29.00	30.73
Hired labor	38.39	39.81
Purchased irrigation water	0.44	0.48
Drying	40.15	43.03
Miscellaneous	1.31	1.35
Technical services	0.85	0.92
Total, variable cash expenses	299.07	315.00
General farm overhead	19.61	19.03
Taxes and insurance	10.36	10.60
Interest on operating loans	11.74	11.81
Interest on real estate	5.55	5.92
Total, fixed cash expenses	47.26	47.36
Total, cash expenses	346.33	362.36
Gross value of production less cash expenses	5.32	37.33
Harvest-month price (dollars/cwt.)	6.94	7.53
Yield (cwt./planted acre)	50.67	53.08

Table 48b--Mississippi (Delta): Rice production economic costs and returns per planted acre, 1988-89

Item	1988	1989
Dollars		
Gross value of production (excl. direct Gov't. payments):		
Rice	351.65	399.69
Total, gross value of production	351.65	399.69
Economic (full ownership) costs:		
Variable cash expenses	299.07	315.00
General farm overhead	19.61	19.03
Taxes and insurance	10.36	10.60
Capital replacement	39.64	41.86
Operating capital	10.35	12.66
Other nonland capital	15.87	19.18
Land	61.68	71.45
Unpaid labor (3.5 hrs)	15.26	15.82
Total, economic costs	470.84	505.60
Residual returns to management and risk	-119.19	-105.91
Harvest-month price (dollars/cwt.)	6.94	7.53
Yield (cwt./planted acre)	50.67	53.08



Table 49a--Lower Texas Coast: Rice production cash costs and returns per planted acre, 1988-89

Item	1988	1989
	Dollars	
Gross value of production (excl. direct Gov't. payments):		
Rice	465.55	480.19
Total, gross value of production	465.55	480.19
Cash expenses:		
Seed (103.6 lbs)	20.29	20.29
Fertilizer (200.1N, 46.5P, 26.9K lbs)	48.37	56.24
Chemicals	48.88	50.81
Custom operations	33.68	35.91
Fuel, lube, and electricity	77.94	81.55
Repairs	35.64	37.69
Hired labor	42.99	44.75
Purchased irrigation water	30.22	32.94
Drying	52.02	49.86
Miscellaneous	2.74	2.83
Technical services	0.16	0.17
Total, variable cash expenses	392.93	413.04
General farm overhead	25.12	24.38
Taxes and insurance	13.53	13.88
Interest on operating loans	21.15	21.28
Interest on real estate	4.13	4.41
Total, fixed cash expenses	63.93	63.95
Total, cash expenses	456.86	476.99
Gross value of production less cash expenses	8.69	3.20
Harvest-month price (dollars/cwt.)	7.10	7.74
Yield (cwt./planted acre)	65.57	62.04

Table 49b--Lower Texas Coast: Rice production economic costs and returns per planted acre, 1988-89

Item	1988	1989
	Dollars	
Gross value of production (excl. direct Gov't. payments):		
Rice	465.55	480.19
Total, gross value of production	465.55	480.19
Economic (full ownership) costs:		
Variable cash expenses	392.93	413.04
General farm overhead	25.12	24.38
Taxes and insurance	13.53	13.88
Capital replacement	59.14	62.07
Operating capital	13.60	16.60
Other nonland capital	20.09	24.21
Land	51.49	53.08
Unpaid labor (6.2 hrs)	31.88	33.19
Total, economic costs	607.78	640.45
Residual returns to management and risk	-142.23	-160.26
Harvest-month price (dollars/cwt.)	7.10	7.74
Yield (cwt./planted acre)	65.57	62.04

Table 50a--Upper Texas Coast: Rice production cash costs and returns per planted acre, 1988-89

Item	1988	1989
Dollars		
Gross value of production (excl. direct Gov't. payments):		
Rice		
Total, gross value of production	365.72	365.71
Cash expenses:		
Seed (111.8 lbs)		
Fertilizer (17G, 48.6P, 24.7K lbs)	21.21	21.43
Chemicals	44.07	51.01
Custom operations	47.55	49.42
Fuel, lube, and electricity	37.71	40.21
Repairs	32.79	35.23
Hired labor	23.09	24.46
Purchased irrigation water	57.30	59.65
Drying	42.51	46.33
Miscellaneous	41.46	39.79
Technical services	1.69	1.74
Total, variable cash expenses	349.87	369.81
General farm overhead		
Taxes and insurance	30.89	29.99
Interest on operating loans	13.93	14.60
Interest on real estate	14.41	14.49
Total, fixed cash expenses	65.80	66.09
Total, cash expenses	415.67	435.90
Gross value of production less cash expenses	-49.95	-58.19
Harvest-month price (dollars/cwt.)	7.10	7.74
Yield (cwt./planted acre)	51.51	48.80

Table 50b--Upper Texas Coast: Rice production economic costs and returns per planted acre, 1988-89

Item	1988	1989
Dollars		
Gross value of production (excl. direct Gov't. payments):		
Rice		
Total, gross value of production	365.72	377.71
Economic (full ownership) costs:		
Variable cash expenses		
General farm overhead	349.87	369.81
Taxes and insurance	30.89	29.99
Capital replacement	13.93	14.60
Operating capital	28.56	30.20
Other nonland capital	12.11	14.87
Land	14.31	17.35
Unpaid labor (5.5 hrs)	34.44	36.41
Total, economic costs	511.41	542.69
Residual returns to management and risk	-145.69	-164.98
Harvest-month price (dollars/cwt.)	7.10	7.74
Yield (cwt./planted acre)	51.51	48.80

Table 51a--Arkansas: Grain sorghum production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments): Grain sorghum	96.89	132.21	121.77
Total, gross value of production	96.89	132.21	121.77
Cash expenses:			
Seed (6.7 lbs)	3.82	5.16	4.89
Fertilizer (78.4N, 19.4P, 20.6K lbs)	19.41	22.75	24.39
Chemicals	5.08	5.16	5.40
Custom operations	1.28	1.26	1.30
Fuel, lube, and electricity	9.65	8.96	9.78
Repairs	7.03	7.13	8.18
Hired labor	2.18	2.14	2.24
Purchased irrigation water	0.04	0.04	0.04
Drying	0.40	0.35	0.34
Technical services	0.12	0.12	0.12
Total, variable cash expenses	49.01	53.07	56.68
General farm overhead	5.79	7.22	7.43
Taxes and insurance	8.51	8.34	9.23
Interest on operating loans	5.09	3.58	4.19
Interest on real estate	4.23	3.54	4.69
Total, fixed cash expenses	23.62	22.68	25.54
Total, cash expenses	72.63	75.75	82.22
Gross value of production less cash expenses	24.26	56.46	39.55
Harvest-period price (dollars/bu.)	1.46	2.26	2.14
Yield (bu./planted acre)	66.36	58.50	56.90

Table 51b--Arkansas: Grain sorghum production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments): Grain sorghum	96.89	132.21	121.77
Total, gross value of production	96.89	132.21	121.77
Economic (full ownership) costs:			
Variable cash expenses	49.01	53.07	56.68
General farm overhead	5.79	7.22	7.43
Taxes and insurance	8.51	8.34	9.23
Capital replacement	27.96	27.60	32.15
Operating capital	1.37	1.72	2.11
Other nonland capital	4.60	5.31	6.85
Land	22.50	30.00	27.93
Unpaid labor (1989-2.1 hrs)	8.74	8.58	8.97
Total, economic costs	128.48	141.84	151.35
Residual returns to management and risk	-31.59	-9.63	-29.58
Harvest-period price (dollars/bu.)	1.46	2.26	2.14
Yield (bu./planted acre)	66.36	58.50	56.90

Table 52a--Kansas: Grain sorghum production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments): Grain sorghum	94.30	132.34	95.83
Total, gross value of production	94.30	132.34	95.83
Cash expenses:			
Seed (4.3 lbs)	2.74	3.04	3.25
Fertilizer (68.4N, 20.4P, 7.3K lbs)	14.39	16.39	17.91
Chemicals	12.06	12.25	12.84
Custom operations	3.03	2.99	2.73
Fuel, lube, and electricity	9.16	8.82	9.72
Repairs	7.85	7.93	9.00
Hired labor	2.04	2.13	2.39
Drying	0.31	0.26	0.22
Technical services	0.07	0.07	0.07
Total, variable cash expenses	51.65	53.88	58.13
General farm overhead	7.19	9.26	8.23
Taxes and insurance	9.11	9.32	9.69
Interest on operating loans	3.89	4.66	5.63
Interest on real estate	7.89	8.18	7.73
Total, fixed cash expenses	28.08	31.42	31.28
Total, cash expenses	79.73	85.30	89.41
Gross value of production less cash expenses	14.57	47.04	6.42
Harvest-period price (dollars/bu.)	1.37	2.33	1.98
Yield (bu./planted acre)	68.83	56.80	48.40

Table 52b--Kansas: Grain sorghum production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments): Grain sorghum	94.30	132.34	95.83
Total, gross value of production	94.30	132.34	95.83
Economic (full ownership) costs:			
Variable cash expenses	51.65	53.88	58.13
General farm overhead	7.19	9.26	8.23
Taxes and insurance	9.11	9.32	9.69
Capital replacement	22.83	23.38	26.74
Operating capital	1.39	1.68	2.13
Other nonland capital	4.38	5.14	6.47
Land	30.22	40.88	30.64
Unpaid labor (1989-1.8 hrs)	8.17	8.52	9.54
Total, economic costs	134.94	152.06	151.57
Residual returns to management and risk	-40.64	-19.72	-55.74
Harvest-period price (dollars/bu.)	1.37	2.33	1.98
Yield (bu./planted acre)	68.83	56.80	48.40

Table 53a--Missouri: Grain sorghum production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Grain sorghum	111.45	179.60	150.00
Total, gross value of production	111.45	179.60	150.00
Cash expenses:			
Seed (7.7 lbs)	4.80	4.80	5.57
Fertilizer (86.5N, 45.2P, 63.6K lbs)	30.04	36.38	39.95
Chemicals	8.97	9.12	9.55
Custom operations	1.63	1.62	1.69
Fuel, lube, and electricity	6.46	5.88	6.79
Repairs	5.14	5.18	5.78
Hired labor	1.85	1.91	2.10
Drying	2.61	2.43	2.38
Total, variable cash expenses	61.50	67.32	73.81
General farm overhead	6.65	10.78	11.47
Taxes and insurance	7.71	7.69	8.44
Interest on operating loans	3.87	5.14	5.53
Interest on real estate	8.37	12.61	11.25
Total, fixed cash expenses	26.60	36.22	36.69
Total, cash expenses	88.10	103.54	110.50
Gross value of production less cash expenses	23.35	76.06	39.50
Harvest-period price (dollars/bu.)	1.33	2.36	2.00
Yield (bu./planted acre)	83.80	76.10	75.00

Table 53b--Missouri: Grain sorghum production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Grain sorghum	111.45	179.60	150.00
Total, gross value of production	111.45	179.60	150.00
Economic (full ownership) costs:			
Variable cash expenses	61.50	67.32	73.81
General farm overhead	6.65	10.78	11.47
Taxes and insurance	7.71	7.69	8.44
Capital replacement	24.84	25.55	29.58
Operating capital	1.69	2.16	2.75
Other nonland capital	4.03	4.80	5.94
Land	32.46	50.55	43.55
Unpaid labor (1989-1.6 hrs)	7.40	7.66	8.39
Total, economic costs	146.28	176.51	183.93
Residual returns to management and risk	-34.83	3.09	-33.93
Harvest-period price (dollars/bu.)	1.33	2.36	2.00
Yield (bu./planted acre)	83.80	76.10	75.00

Table 54a--Texas: Grain sorghum production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Grain sorghum	90.68	149.35	100.37
Total, gross value of production	90.68	149.35	100.37
Cash expenses:			
Seed (6.5 lbs)	6.99	3.82	4.08
Fertilizer (71N, 15.8P, 1.7K lbs)	13.89	15.64	18.49
Chemicals	6.65	6.76	7.08
Custom operations	6.53	6.56	6.10
Fuel, lube, and electricity	15.87	16.87	17.17
Repairs	8.85	9.62	10.29
Hired labor	3.63	3.69	3.74
Purchased irrigation water	0.38	0.38	0.38
Drying	0.20	0.20	0.16
Total, variable cash expenses	62.99	63.54	67.49
General farm overhead	5.94	9.30	8.18
Taxes and insurance	6.12	6.59	6.38
Interest on operating loans	5.17	6.45	5.72
Interest on real estate	4.67	6.12	5.28
Total, fixed cash expenses	21.90	28.46	25.56
Total, cash expenses	84.89	92.00	93.05
Gross value of production less cash expenses	5.79	57.35	7.32
Harvest-period price (dollars/bu.)	1.51	2.54	2.14
Yield (bu./planted acre)	60.05	58.80	46.90

Table 54b--Texas: Grain sorghum production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Grain sorghum	90.68	149.35	100.37
Total, gross value of production	90.68	149.35	100.37
Economic (full ownership) costs:			
Variable cash expenses	62.99	63.54	67.49
General farm overhead	5.94	9.30	8.18
Taxes and insurance	6.12	6.59	6.38
Capital replacement	23.35	27.61	27.07
Operating capital	1.57	1.78	2.25
Other nonland capital	3.97	5.40	5.88
Land	25.59	39.65	28.65
Unpaid labor (1989-2.9 hrs)	14.53	14.75	14.98
Total, economic costs	144.06	168.62	160.88
Residual returns to management and risk	-53.38	-19.27	-60.51
Harvest-period price (dollars/bu.)	1.51	2.54	2.14
Yield (bu./planted acre)	60.05	58.80	46.90

Table 55a--Alabama: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans	83.16	187.89	112.32
Total, gross value of production	83.16	187.89	112.32
Cash expenses:			
Seed (43.6 lbs)	8.72	8.28	10.46
Fertilizer (10.4N, 31.1P, 45.1K (bs)	13.09	16.65	17.64
Lime and gypsum (.28L ton)	4.65	4.51	4.51
Chemicals	17.44	17.72	18.56
Custom operations	1.17	1.17	1.25
Fuel, lube, and electricity	11.25	12.48	13.23
Repairs	11.41	13.57	14.16
Hired labor	4.28	4.89	4.97
Total, variable cash expenses	72.01	79.26	84.78
General farm overhead	4.42	11.20	6.08
Taxes and insurance	5.85	6.44	6.25
Interest on operating loans	2.59	5.22	2.49
Interest on real estate	3.53	11.37	4.52
Total, fixed cash expenses	16.39	34.23	19.34
Total, cash expenses	88.40	113.49	104.12
Gross value of production less cash expenses	-5.24	74.40	8.20
Harvest-period price (dollars/bu.)	5.25	7.78	5.63
Yield (bu./planted acre)	15.84	24.15	19.95

Table 55b--Alabama: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans	83.16	187.89	112.32
Total, gross value of production	83.16	187.89	112.32
Economic (full ownership) costs:			
Variable cash expenses	72.01	79.26	84.78
General farm overhead	4.42	11.20	6.08
Taxes and insurance	5.85	6.44	6.25
Capital replacement	25.76	28.91	31.51
Operating capital	1.66	2.03	2.54
Other nonland capital	4.42	5.96	6.93
Land	20.15	27.83	22.65
Unpaid labor (1989-3.8 hrs)	16.10	18.38	18.69
Total, economic costs	150.37	180.01	179.43
Residual returns to management and risk	-67.21	7.88	-67.11
Harvest-period price (dollars/bu.)	5.25	7.78	5.63
Yield (bu./planted acre)	15.84	24.15	19.95

Table 56a--Arkansas: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans	122.81	191.49	134.97
Total, gross value of production	122.81	191.49	134.97
Cash expenses:			
Seed (66.1 lbs)	12.56	11.90	13.22
Fertilizer (2.1N, 4P, 5.6K lbs)	1.76	2.13	2.24
Chemicals	7.15	7.26	7.61
Custom operations	0.29	0.30	0.36
Fuel, lube, and electricity	8.74	8.40	9.13
Repairs	5.99	6.52	7.16
Hired labor	2.25	2.29	2.34
Technical services	0.11	0.11	0.11
Total, variable cash expenses	38.85	38.91	42.17
General farm overhead	7.34	10.46	8.23
Taxes and insurance	8.59	8.85	8.91
Interest on operating loans	6.45	5.19	4.64
Interest on real estate	5.37	5.13	5.20
Total, fixed cash expenses	27.75	29.63	26.98
Total, cash expenses	66.60	68.54	69.15
Gross value of production less cash expenses	56.21	122.95	65.82
Harvest-period price (dollars/bu.)	5.67	7.48	5.80
Yield (bu./planted acre)	21.66	25.60	23.27

Table 56b--Arkansas: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans	122.81	191.49	134.97
Total, gross value of production	122.81	191.49	134.97
Economic (full ownership) costs:			
Variable cash expenses	38.85	38.91	42.17
General farm overhead	7.34	10.46	8.23
Taxes and insurance	8.59	8.85	8.91
Capital replacement	26.83	28.70	31.73
Operating capital	1.13	1.28	1.60
Other nonland capital	4.27	5.37	6.55
Land	28.59	43.57	32.33
Unpaid labor (1989-1.9 hrs)	8.45	8.63	8.80
Total, economic costs	124.05	145.77	140.32
Residual returns to management and risk	-1.24	45.72	-5.35
Harvest-period price (dollars/bu.)	5.67	7.48	5.80
Yield (bu./planted acre)	21.66	25.60	23.27



Table 57a--Georgia: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans			
Total, gross value of production	98.89	177.55	138.53
Cash expenses:			
Seed (50.6 lbs)	10.62	9.61	11.13
Fertilizer (6.6N, 32.9P, 63.8K lbs)	14.44	17.92	17.69
Chemicals	17.73	18.02	18.88
Custom operations	9.95	10.07	12.02
Fuel, lube, and electricity	10.37	9.89	11.58
Repairs	9.28	10.58	11.83
Hired labor	2.61	2.94	3.12
Total, variable cash expenses	75.00	79.03	86.25
General farm overhead	5.26	10.58	7.49
Taxes and insurance	9.62	10.06	10.22
Interest on operating loans	3.08	4.94	3.08
Interest on real estate	4.20	10.74	5.57
Total, fixed cash expenses	22.16	36.32	26.36
Total, cash expenses	97.16	115.35	112.61
Gross value of production less cash expenses	1.73	62.20	25.92
Harvest-period price (dollars/bu.)	5.26	7.34	5.57
Yield (bu./planted acre)	18.80	24.19	24.87

Table 57b--Georgia: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans			
Total, gross value of production	98.89	177.55	138.53
Economic (full ownership) costs:			
Variable cash expenses	75.00	79.03	86.25
General farm overhead	5.26	10.58	7.49
Taxes and insurance	9.62	10.06	10.22
Capital replacement	26.65	29.27	33.23
Operating capital	2.00	2.38	2.93
Other nonland capital	4.41	5.72	7.08
Land	14.36	19.59	19.65
Unpaid labor (1989-2.4 hrs)	9.81	11.06	11.75
Total, economic costs	147.11	167.69	178.61
Residual returns to management and risk	-48.22	9.86	-40.08
Harvest-period price (dollars/bu.)	5.26	7.34	5.57
Yield (bu./planted acre)	18.80	24.19	24.87

Table 58a--Illinois: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans			
Total, value of production	191.56	201.51	221.97
Cash expenses:			
Seed (59.7 lbs)	11.94	12.53	16.11
Fertilizer (1.3N, 8.5P, 22K lbs)	4.07	5.14	5.28
Lime and gypsum (.011 ton)	0.13	0.13	0.12
Chemicals	12.45	12.65	13.25
Custom operations	1.15	1.16	1.24
Fuel, lube, and electricity	8.04	8.09	9.18
Repairs	5.61	5.58	6.58
Hired labor	2.33	2.34	2.47
Technical services	0.11	0.11	0.11
Total, variable cash expenses	45.83	47.73	54.34
General farm overhead	11.44	12.09	16.98
Taxes and insurance	20.50	20.69	21.06
Interest on operating loans	6.65	5.76	8.19
Interest on real estate	14.39	14.15	16.65
Total, fixed cash expenses	52.98	52.69	62.88
Total, cash expenses	98.81	100.42	117.22
Gross value of production less cash expenses	92.75	101.09	104.75
Harvest-period price (dollars/bu.)	5.10	7.55	5.58
Yield (bu./planted acre)	37.56	26.69	39.78

Table 58b--Illinois: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans			
Total, value of production	191.56	201.51	221.97
Economic (full ownership) costs:			
Variable cash expenses	45.83	47.73	54.34
General farm overhead	11.44	12.09	16.98
Taxes and insurance	20.50	20.69	21.06
Capital replacement	35.21	36.79	43.17
Operating capital	1.15	1.38	1.77
Other nonland capital	5.22	6.25	7.95
Land	51.32	54.36	60.88
Unpaid labor (1989-1.7 hrs)	8.76	8.81	9.29
Total, economic costs	179.43	188.10	215.44
Residual returns to management and risk	12.13	13.41	6.53
Harvest-period price (dollars/bu.)	5.10	7.55	5.58
Yield (bu./planted acre)	37.56	26.69	39.78

Table 59a--Indiana: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans	198.44	205.21	205.69
Total, gross value of production	198.44	205.21	205.69
Cash expenses:			
Seed (56.1 lbs)	10.65	10.09	14.57
Fertilizer (4.2N, 18.3P, 46.3K lbs)	8.88	11.21	11.67
Lime and gypsum (.04L ton)	0.51	0.52	0.48
Chemicals	16.72	16.98	17.79
Custom operations	3.46	3.48	3.72
Fuel, lube, and electricity	9.46	9.22	10.69
Repairs	6.22	6.19	7.31
Hired labor	3.05	3.08	3.21
Technical services	0.17	0.17	0.17
Total, variable cash expenses	59.12	60.94	69.61
General farm overhead	11.85	12.31	15.74
Taxes and insurance	13.45	13.47	13.95
Interest on operating loans	6.89	5.87	7.59
Interest on real estate	14.90	14.41	15.43
Total, fixed cash expenses	47.09	46.06	52.71
Total, cash expenses	106.21	107.00	122.32
Gross value of production less cash expenses	92.23	98.21	83.37
Harvest-period price (dollars/bu.)	5.02	7.64	5.62
Yield (bu./planted acre)	39.53	26.86	36.60

Table 59b--Indiana: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans	198.44	205.21	205.69
Total, gross value of production	198.44	205.21	205.69
Economic (full ownership) costs:			
Variable cash expenses	59.12	60.94	69.61
General farm overhead	11.85	12.31	15.74
Taxes and insurance	13.45	13.47	13.95
Capital replacement	37.10	38.38	45.76
Operating capital	1.44	1.72	2.23
Other nonland capital	5.45	6.48	8.42
Land	54.42	55.26	57.98
Unpaid labor (1989-2.2 hrs)	11.46	11.60	12.08
Total, economic costs	194.29	200.16	225.77
Residual returns to management and risk	4.15	5.05	-20.08
Harvest-period price (dollars/bu.)	5.02	7.64	5.62
Yield (bu./planted acre)	39.53	26.86	36.60

Table 60a--Iowa: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Soybeans	214.42	233.23	212.84
Total, gross value of production	214.42	233.23	212.84
Cash expenses:			
Seed (56.1 lbs)	11.77	13.46	15.70
Fertilizer (.8N, 1.1P, 4.7K (bs)	0.79	1.02	1.08
Lime and gypsum (.02L ton)	0.25	0.26	0.24
Chemicals	12.87	13.08	13.70
Custom operations	6.41	6.46	6.59
Fuel, lube, and electricity	10.12	10.08	11.07
Repairs	5.66	5.79	6.63
Hired labor	2.70	2.84	3.15
Technical services	0.02	0.02	0.02
Total, variable cash expenses	50.59	53.00	58.18
General farm overhead	12.80	13.99	16.28
Taxes and insurance	18.24	18.46	18.77
Interest on operating loans	7.44	6.67	7.85
Interest on real estate	16.10	16.37	15.96
Total, fixed cash expenses	54.58	55.49	58.86
Total, cash expenses	105.17	108.49	117.04
Gross value of production less cash expenses	109.25	124.74	95.80
Harvest-period price (dollars/bu.)	4.96	7.57	5.47
Yield (bu./planted acre)	43.23	30.81	38.91

Table 60b--Iowa: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Soybeans	214.42	233.23	212.84
Total, gross value of production	214.42	233.23	212.84
Economic (full ownership) costs:			
Variable cash expenses	50.59	53.00	58.18
General farm overhead	12.80	13.99	16.28
Taxes and insurance	18.24	18.46	18.77
Capital replacement	36.35	38.02	44.17
Operating capital	1.21	1.47	1.86
Other nonland capital	5.46	6.61	8.33
Land	64.89	71.08	70.21
Unpaid labor (1989-2.1 hrs)	10.18	10.66	11.85
Total, economic costs	199.72	213.30	229.65
Residual returns to management and risk	14.70	19.93	-16.81
Harvest-period price (dollars/bu.)	4.96	7.57	5.47
Yield (bu./planted acre)	43.23	30.81	38.91

Table 61a--Kentucky: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans			
Total, gross value of production	124.59	188.76	172.90
Cash expenses:			
Seed (59.8 lbs)	10.17	10.76	13.75
Fertilizer (5.8N, 27.8P, 32.8K lbs)	10.15	12.70	12.59
Lime and gypsum (.09L ton)	1.49	1.45	1.45
Chemicals	8.70	8.84	9.26
Custom operations	3.80	3.72	4.10
Fuel, lube, and electricity	4.84	4.74	5.78
Repairs	5.46	5.74	6.71
Hired labor	1.95	2.18	2.35
Total, variable cash expenses	46.56	50.13	55.99
General farm overhead	7.08	10.42	16.53
Taxes and insurance	4.23	4.25	4.51
Interest on operating loans	3.78	3.51	6.67
Interest on real estate	7.95	10.55	8.45
Total, fixed cash expenses	23.04	28.73	36.16
Total, cash expenses	69.60	78.86	92.15
Gross value of production less cash expenses	54.99	109.90	80.75
Harvest-period price (dollars/bu.)	5.14	7.67	5.63
Yield (bu./planted acre)	24.24	24.61	30.71

Table 61b--Kentucky: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans			
Total, gross value of production	124.59	188.76	172.90
Economic (full ownership) costs:			
Variable cash expenses	46.56	50.13	55.99
General farm overhead	7.08	10.42	16.53
Taxes and insurance	4.23	4.25	4.51
Capital replacement	16.73	17.25	20.72
Operating capital	1.05	1.31	1.66
Other nonland capital	2.79	3.37	4.39
Land	31.98	41.97	41.86
Unpaid labor (1.8 hrs)	7.34	8.22	8.83
Total, economic costs	117.76	136.92	154.49
Residual returns to management and risk	6.83	51.84	18.41
Harvest-period price (dollars/bu.)	5.14	7.67	5.63
Yield (bu./planted acre)	24.24	24.61	30.71

Table 62a--Louisiana: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans			
Total, gross value of production	121.47	212.95	109.97
Cash expenses:			
Seed (53.3 lbs)	7.99	11.18	12.78
Fertilizer (2.3W, 30.9P, 52.1K lbs)	12.22	15.62	15.77
Chemicals	9.67	9.82	10.29
Custom operations	2.61	2.68	2.77
Fuel, lube, and electricity	7.81	8.25	7.92
Repairs	5.92	6.39	6.80
Hired labor	1.88	1.91	1.91
Technical services	0.01	0.01	0.01
Total, variable cash expenses	48.11	55.86	58.25
General farm overhead	7.26	11.63	6.71
Taxes and insurance	8.45	8.65	8.52
Interest on operating loans	6.38	5.77	3.78
Interest on real estate	5.31	5.71	4.23
Total, fixed cash expenses	27.40	31.76	23.24
Total, cash expenses	75.51	87.62	81.49
Gross value of production less cash expenses	45.96	125.33	28.48
Harvest-period price (dollars/bu.)	5.33	7.53	5.89
Yield (bu./planted acre)	22.79	28.28	18.67

Table 62b--Louisiana: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans			
Total, gross value of production	121.47	212.95	109.97
Economic (full ownership) costs:			
Variable cash expenses	48.11	55.86	58.25
General farm overhead	7.26	11.63	6.71
Taxes and insurance	8.45	8.65	8.52
Capital replacement	32.04	33.96	36.00
Operating capital	1.17	1.54	1.88
Other nonland capital	4.77	5.94	6.99
Land	19.98	35.86	19.78
Unpaid labor (1989-1.6 hrs)	7.06	7.19	7.19
Total, economic costs	128.84	160.63	145.32
Residual returns to management and risk	-7.37	52.32	-35.35
Harvest-period price (dollars/bu.)	5.33	7.53	5.89
Yield (bu./planted acre)	22.79	28.28	18.67

**Table 63a--Minnesota: Soybean production cash costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans	187.55	190.26	198.90
Total, gross value of production	187.55	190.26	198.90
Cash expenses:			
Seed (78.3 lbs)	12.53	14.88	18.02
Fertilizer (.6N, 3.3P, 4.9K lbs)	1.24	1.52	1.56
Chemicals	10.27	10.44	10.93
Custom operations	3.23	3.22	3.63
Fuel, lube, and electricity	8.87	8.37	9.57
Repairs	7.51	7.69	8.82
Hired labor	2.63	2.66	2.84
Technical services	0.02	0.02	0.02
Total, variable cash expenses	46.30	48.80	55.38
General farm overhead	16.11	16.13	23.87
Taxes and insurance	15.89	15.96	16.36
Interest on operating loans	8.72	8.45	9.35
Interest on real estate	17.44	20.36	20.47
Total, fixed cash expenses	58.16	60.90	70.05
Total, cash expenses	104.46	109.70	125.43
Gross value of production less cash expenses	83.09	80.56	73.47
Harvest-period price (dollars/bu.)	4.86	7.47	5.43
Yield (bu./planted acre)	38.59	25.47	36.63

**Table 63b--Minnesota: Soybean production economic costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans	187.55	190.26	198.90
Total, gross value of production	187.55	190.26	198.90
Economic (full ownership) costs:			
Variable cash expenses	46.30	48.80	55.38
General farm overhead	16.11	16.13	23.87
Taxes and insurance	15.89	15.96	16.36
Capital replacement	29.21	30.25	35.23
Operating capital	1.08	1.32	1.70
Other nonland capital	5.47	6.52	8.34
Land	47.50	50.64	56.22
Unpaid labor (1989-2.1 hrs)	9.90	10.00	10.66
Total, economic costs	171.46	179.62	207.77
Residual returns to management and risk	16.09	10.64	-8.87
Harvest-period price (dollars/bu.)	4.86	7.47	5.43
Yield (bu./planted acre)	38.59	25.47	36.63

Table 64a--Mississippi: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans			
Total, gross value of production	103.26	152.46	105.63
Cash expenses:			
Seed (52 lbs)	8.32	8.84	9.88
Fertilizer (1.5N, 17.5P, 33.9K lbs)	7.41	9.54	10.35
Chemicals	8.90	9.04	9.47
Custom operations	4.86	4.84	5.52
Fuel, lube, and electricity	11.99	12.75	12.32
Repairs	9.01	9.71	10.56
Hired labor	3.33	3.38	3.42
Total, variable cash expenses	53.82	58.10	61.52
General farm overhead	6.17	8.32	6.44
Taxes and insurance	7.83	8.02	7.96
Interest on operating loans	5.42	4.13	3.63
Interest on real estate	4.51	4.09	4.07
Total, fixed cash expenses	23.93	24.56	22.10
Total, cash expenses	77.75	82.66	83.62
Gross value of production less cash expenses	25.51	69.80	22.01
Harvest-period price (dollars/bu.)	5.51	7.39	5.81
Yield (bu./planted acre)	18.74	20.63	18.18

Table 64b--Mississippi: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans			
Total, gross value of production	103.26	152.46	105.63
Economic (full ownership) costs:			
Variable cash expenses	53.82	58.10	61.52
General farm overhead	6.17	8.32	6.44
Taxes and insurance	7.83	8.02	7.96
Capital replacement	28.77	30.26	33.09
Operating capital	1.54	1.88	2.29
Other nonland capital	5.54	6.88	8.23
Land	19.53	26.18	23.18
Unpaid labor (1989-2.8 hrs)	12.53	12.72	12.88
Total, economic costs	135.73	152.36	155.59
Residual returns to management and risk	-32.47	0.10	-49.96
Harvest-period price (dollars/bu.)	5.51	7.39	5.81
Yield (bu./planted acre)	18.74	20.63	18.18



Table 65a--Missouri: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans	156.12	197.35	151.33
Total, gross value of production	156.12	197.35	151.33
Cash expenses:			
Seed (60.8 lbs)	9.73	10.34	12.77
Fertilizer (1.7N, 11.9P, 22.1K lbs)	4.90	6.10	6.50
Chemicals	13.08	13.29	13.93
Custom operations	6.41	6.35	6.44
Fuel, lube, and electricity	7.07	7.09	7.70
Repairs	5.68	6.91	6.70
Hired labor	2.27	2.60	2.63
Total, variable cash expenses	49.14	52.68	56.67
General farm overhead	9.32	11.84	11.58
Taxes and insurance	7.30	8.06	7.78
Interest on operating loans	5.42	5.64	5.58
Interest on real estate	11.72	13.85	11.35
Total, fixed cash expenses	33.76	39.39	36.29
Total, cash expenses	82.90	92.07	92.96
Gross value of production less cash expenses	73.22	105.28	58.37
Harvest-period price (dollars/bu.)	4.95	7.57	5.37
Yield (bu./planted acre)	31.54	26.07	28.18

Table 65b--Missouri: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production			
Soybeans	156.12	197.35	151.33
Total, gross value of production	156.12	197.35	151.33
Economic (full ownership) costs:			
Variable cash expenses	49.14	52.68	56.67
General farm overhead	9.32	11.84	11.58
Taxes and insurance	7.30	8.06	7.78
Capital replacement	28.38	33.51	37.35
Operating capital	1.10	1.33	1.71
Other nonland capital	4.44	6.19	7.10
Land	46.22	58.33	46.26
Unpaid labor (1.8 hrs)	8.52	9.80	9.89
Total, economic costs	154.42	181.74	178.34
Residual returns to management and risk	1.70	15.61	-27.01
Harvest-period price (dollars/bu.)	4.95	7.57	5.37
Yield (bu./planted acre)	31.54	26.07	28.18

Table 66a--North Carolina: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans			
Total, gross value of production	129.44	189.89	147.02
Cash expenses:			
Seed (55.8 lbs)	10.61	10.05	12.28
Fertilizer (6N, 16P, 30.5K lbs)	7.45	9.25	9.93
Lime and gypsum (.11L ton)	2.61	2.55	2.65
Chemicals	8.17	8.30	8.70
Custom operations	7.52	7.61	8.85
Fuel, lube, and electricity	10.79	10.94	12.16
Repairs	0.86	9.58	10.62
Hired labor	4.36	4.41	4.55
Total, variable cash expenses	60.37	62.69	69.74
General farm overhead	7.35	10.48	14.06
Taxes and insurance	7.71	7.92	8.04
Interest on operating loans	3.92	3.53	5.67
Interest on real estate	8.26	10.61	7.19
Total, fixed cash expenses	27.24	32.54	34.96
Total, cash expenses	87.61	95.23	104.70
Gross value of production less cash expenses	41.83	94.66	42.32
Harvest-period price (dollars/bu.)	5.52	7.36	5.62
Yield (bu./planted acre)	23.45	25.80	26.16

Table 66b--North Carolina: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production			
Soybeans			
Total, gross value of production	129.44	189.89	147.02
Economic (full ownership) costs:			
Variable cash expenses	60.37	62.69	69.74
General farm overhead	7.35	10.48	14.06
Taxes and insurance	7.71	7.92	8.04
Capital replacement	23.30	24.92	28.21
Operating capital	1.71	2.01	2.54
Other nonland capital	4.21	5.27	6.51
Land	15.14	18.61	17.74
Unpaid labor (1989-3.5 hrs)	16.39	16.59	17.11
Total, economic costs	136.18	148.49	163.95
Residual returns to management and risk	-6.74	41.40	-16.93
Harvest-period price (dollars/bu.)	5.52	7.36	5.62
Yield (bu./planted acre)	23.45	25.80	26.16

Table 67a--Ohio: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Soybeans			
Total, gross value of production	189.25	191.13	176.71
Cash expenses:			
Seed (77.4 lbs)	13.16	13.93	18.58
Fertilizer (2.7N, 11.1P, 47K lbs)	7.47	9.49	9.65
Chemicals	11.89	12.08	12.66
Custom operations	3.28	3.30	3.28
Fuel, lube, and electricity	7.29	9.50	7.82
Repairs	5.66	10.23	6.42
Hired labor	2.54	3.69	2.64
Technical services	0.02	0.02	0.02
Total, variable cash expenses	51.31	62.24	61.07
General farm overhead	11.30	11.47	13.52
Taxes and insurance	15.76	18.11	16.02
Interest on operating loans	6.57	5.47	6.52
Interest on real estate	14.21	13.42	13.25
Total, fixed cash expenses	47.84	48.47	49.31
Total, cash expenses	99.15	110.71	110.38
Gross value of production less cash expenses	90.10	80.42	66.33
Harvest-period price (dollars/bu.)	5.14	7.46	5.55
Yield (bu./planted acre)	36.82	25.62	31.84

Table 67b--Ohio: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production			
Soybeans			
Total, gross value of production	189.25	191.13	176.71
Economic (full ownership) costs:			
Variable cash expenses	51.31	62.24	61.07
General farm overhead	11.30	11.47	13.52
Taxes and insurance	15.76	18.11	16.02
Capital replacement	32.87	40.08	38.48
Operating capital	1.23	1.50	1.95
Other nonland capital	4.78	8.00	7.01
Land	46.14	47.29	47.49
Unpaid labor (1989-1.8 hrs)	9.57	13.87	9.95
Total, economic costs	172.96	202.56	195.49
Residual returns to management and risk	16.29	-11.43	-18.78
Harvest-period price (dollars/bu.)	5.14	7.46	5.55
Yield (bu./planted acre)	36.82	25.62	31.84

Table 68a--Tennessee: Soybean production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production			
Soybeans			
Total, gross value of production	120.78	185.24	136.65
Cash expenses:			
Seed (48.2 lbs)	8.20	9.16	11.09
Fertilizer (10.7N, 25.9P, 33.9K lbs)	10.88	13.57	14.26
Lime and gypsum (.08L ton)	1.33	1.29	1.29
Chemicals	18.80	19.10	20.01
Custom operations	4.41	4.40	4.62
Fuel, lube, and electricity	7.92	7.34	7.96
Repairs	8.71	8.13	8.92
Hired labor	2.14	2.18	2.23
Technical services	0.01	0.01	0.01
Total, variable cash expenses	62.40	65.18	70.39
General farm overhead	6.86	10.23	13.06
Taxes and insurance	8.09	7.79	7.89
Interest on operating loans	3.66	3.45	5.27
Interest on real estate	7.71	10.35	6.68
Total, fixed cash expenses	26.32	31.82	32.90
Total, cash expenses	88.72	97.00	103.29
Gross value of production less cash expenses	32.06	88.24	33.36
Harvest-period price (dollars/bu.)	5.46	7.53	5.97
Yield (bu./planted acre)	22.12	24.60	22.89

Table 68b--Tennessee: Soybean production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production			
Soybeans			
Total, gross value of production	120.78	185.24	136.65
Economic (full ownership) costs:			
Variable cash expenses	62.40	65.18	70.39
General farm overhead	6.86	10.23	13.06
Taxes and insurance	8.09	7.79	7.89
Capital replacement	31.97	32.19	36.23
Operating capital	1.63	2.03	2.53
Other nonland capital	4.69	5.33	6.57
Land	27.55	41.50	31.83
Unpaid labor (1989-1.7 hrs)	8.05	8.20	8.41
Total, economic costs	151.24	172.45	176.91
Residual returns to management and risk	-30.46	12.79	-40.26
Harvest-period price (dollars/bu.)	5.46	7.53	5.97
Yield (bu./planted acre)	22.12	24.60	22.89

Table 69a--Colorado: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	67.19	101.20	83.48
Wheat straw	0.66	0.79	0.94
Total, gross value of production	67.85	101.99	84.42
Cash expenses:			
Seed (51.3 lbs)	3.80	3.03	4.00
Fertilizer (29.3N, 2.0P lbs)	5.44	5.42	6.08
Chemicals	0.92	0.93	0.98
Custom operations	4.24	4.77	4.09
Fuel, lube, and electricity	4.48	4.87	5.11
Repairs	5.36	5.68	5.98
Hired labor	1.80	1.99	1.82
Technical services	0.15	0.15	0.15
Total, variable cash expenses	26.18	26.84	28.21
General farm overhead	6.12	8.39	8.20
Taxes and insurance	5.00	5.19	5.13
Interest on operating loans	3.30	4.78	3.69
Interest on real estate	9.87	8.62	3.88
Total, fixed cash expenses	24.29	26.98	25.90
Total, cash expenses	50.47	53.82	54.11
Gross value of production less cash expenses	17.38	48.17	30.31
Harvest-period price (dollars/bu.)	2.18	3.25	3.73
Yield (bu./planted acre)	30.82	31.14	22.38

Table 69b--Colorado: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	67.19	101.20	83.48
Wheat straw	0.66	0.79	0.94
Total, gross value of production	67.85	101.99	84.42
Economic (full ownership) costs:			
Variable cash expenses	26.18	26.84	28.21
General farm overhead	6.12	8.39	8.20
Taxes and insurance	5.00	5.19	5.13
Capital replacement	15.19	16.35	16.59
Operating capital	1.17	1.35	1.74
Other nonland capital	2.76	3.44	3.82
Land	12.14	18.03	15.28
Unpaid labor (1989-.8 hrs)	3.99	4.42	4.06
Total, economic costs	72.56	84.01	83.03
Residual returns to management and risk	-4.71	17.98	1.39
Harvest-period price (dollars/bu.)	2.18	3.25	3.73
Yield (bu./planted acre)	30.82	31.14	22.38

Table 70a--Idaho: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Wheat	168.88	219.13	249.23
Wheat straw	1.59	2.09	2.18
Total, gross value of production	170.47	221.22	251.41
Cash expenses:			
Seed (99.3 lbs)	10.33	8.54	12.41
Fertilizer (100.7N, 17.7P, 1.8K, 4.4S lbs)	28.48	29.40	32.47
Chemicals	11.57	11.76	12.32
Custom operations	4.06	4.23	4.54
Fuel, lube, and electricity	21.63	21.53	22.91
Repairs	12.32	12.74	14.05
Hired labor	5.79	5.96	6.55
Purchased irrigation water	4.86	4.86	4.86
Total, variable cash expenses	99.04	99.02	110.11
General farm overhead	15.38	18.21	24.41
Taxes and insurance	12.93	12.95	13.29
Interest on operating loans	8.30	10.38	10.99
Interest on real estate	24.79	18.69	26.45
Total, fixed cash expenses	61.40	60.23	75.14
Total, cash expenses	160.44	159.25	185.25
Gross value of production less cash expenses	10.03	61.97	66.16
Harvest-period price (dollars/bu.)	2.39	3.54	3.98
Yield (bu./planted acre)	70.66	61.90	62.62

Table 70b--Idaho: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
Dollars			
Gross value of production (excl. direct Gov't. payments):			
Wheat	168.88	219.13	249.23
Wheat straw	1.59	2.09	2.18
Total, gross value of production	170.47	221.22	251.41
Economic (full ownership) costs:			
Variable cash expenses	99.04	99.02	110.11
General farm overhead	15.38	18.21	24.41
Taxes and insurance	12.93	12.95	13.29
Capital replacement	34.49	35.55	39.24
Operating capital	3.92	4.51	5.80
Other nonland capital	6.75	8.08	9.82
Land	66.23	80.37	90.04
Unpaid labor (1989-2.9 hrs)	12.89	13.27	14.58
Total, economic costs	251.63	271.96	307.29
Residual returns to management and risk	-81.16	-50.74	-55.88
Harvest-period price (dollars/bu.)	2.39	3.54	3.98
Yield (bu./planted acre)	70.66	61.90	62.62

Table 71a--Illinois: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Wheat	118.20	181.20	215.16
Wheat straw	6.23	8.45	6.92
Total, gross value of production	124.43	189.65	222.08
Cash expenses:			
Seed (105.1 lbs)	11.56	10.83	12.72
Fertilizer (58.2N, 75.1P, 65.5K lbs)	29.91	36.65	37.21
Chemicals	1.67	1.70	1.78
Custom operations	2.27	2.45	2.67
Fuel, lube, and electricity	5.53	5.60	6.62
Repairs	4.75	5.04	5.80
Hired labor	3.02	3.15	3.26
Technical services	0.06	0.06	0.06
Total, variable cash expenses	58.77	65.48	70.12
General farm overhead	7.43	11.38	16.99
Taxes and insurance	12.45	12.22	13.25
Interest on operating loans	4.32	5.42	8.19
Interest on real estate	9.35	13.31	16.66
Total, fixed cash expenses	33.55	42.33	55.09
Total, cash expenses	92.32	107.81	125.21
Gross value of production less cash expenses	32.11	81.84	96.87
Harvest-period price (dollars/bu.)	2.32	3.49	3.79
Yield (bu./planted acre)	50.95	51.92	56.77

Table 71b--Illinois: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Wheat	118.20	181.20	215.16
Wheat straw	6.23	8.45	6.92
Total, gross value of production	124.43	189.65	222.08
Economic (full ownership) costs:			
Variable cash expenses	58.77	65.48	70.12
General farm overhead	7.43	11.38	16.99
Taxes and insurance	12.45	12.22	13.25
Capital replacement	18.05	19.66	22.61
Operating capital	2.84	3.62	4.43
Other nonland capital	3.40	4.29	5.41
Land	36.93	63.01	75.28
Unpaid labor (1989-1.3 hrs)	6.73	7.02	7.26
Total, economic costs	146.60	186.68	215.35
Residual returns to management and risk	-22.17	2.97	6.73
Harvest-period price (dollars/bu.)	2.32	3.49	3.79
Yield (bu./planted acre)	50.95	51.92	56.77

Table 72a--Kansas: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Wheat	78.73	103.56	67.20
Wheat straw	0.69	0.53	0.86
Total, gross value of production	79.42	104.09	68.06
Cash expenses:			
Seed (71.4 lbs)	6.28	6.14	7.07
Fertilizer (42.3N, 10.5P, .9K lbs)	8.01	9.14	10.01
Lime and gypsum (.44L ton)	7.20	7.03	6.98
Chemicals	1.26	1.28	1.34
Custom operations	4.90	5.10	3.33
Fuel, lube, and electricity	6.52	6.19	6.55
Repairs	6.61	6.84	6.98
Hired labor	2.70	2.87	2.96
Technical services	0.05	0.05	0.05
Total, variable cash expenses	43.53	44.64	45.27
General farm overhead	6.05	7.29	5.85
Taxes and insurance	9.99	10.47	10.76
Interest on operating loans	3.27	3.66	3.99
Interest on real estate	6.65	6.43	5.49
Total, fixed cash expenses	25.96	27.85	26.09
Total, cash expenses	69.49	72.49	71.36
Gross value of production less cash expenses	9.93	31.60	-3.30
Harvest-period price (dollars/bu.)	2.30	3.27	3.90
Yield (bu./planted acre)	34.23	31.67	17.23

Table 72b--Kansas: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	Dollars		
Gross value of production (excl. direct Gov't. payments):			
Wheat	78.73	103.56	67.20
Wheat straw	0.69	0.53	0.86
Total, gross value of production	79.42	104.09	68.06
Economic (full ownership) costs:			
Variable cash expenses	43.53	44.64	45.27
General farm overhead	6.05	7.29	5.85
Taxes and insurance	9.99	10.47	10.76
Capital replacement	19.98	20.87	21.49
Operating capital	1.59	1.88	2.38
Other nonland capital	3.84	4.63	5.13
Land	20.20	26.99	15.80
Unpaid labor (1989-1.1 hrs)	6.02	6.39	6.59
Total, economic costs	111.20	123.16	113.27
Residual returns to management and risk	-31.78	-19.07	-45.21
Harvest-period price (dollars/bu.)	2.30	3.27	3.90
Yield (bu./planted acre)	34.23	31.67	17.23



Table 73a--Minnesota: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	88.66	71.24	137.90
Wheat straw	3.21	4.32	3.40
Total, gross value of production	91.87	75.56	141.30
Cash expenses:			
Seed (109.4 lbs)	9.40	9.40	12.58
Fertilizer (78.4N, 28P, 21.6K lbs)	18.86	23.02	23.57
Chemicals	4.34	4.41	4.63
Custom operations	1.11	1.02	1.20
Fuel, lube, and electricity	7.06	6.42	7.59
Repairs	6.59	6.37	7.68
Hired labor	2.56	2.44	2.74
Technical services	0.02	0.02	0.02
Total, variable cash expenses	49.94	53.10	60.01
General farm overhead	7.89	6.41	16.96
Taxes and insurance	12.74	12.05	13.45
Interest on operating loans	4.27	3.35	6.64
Interest on real estate	8.54	8.08	14.54
Total, fixed cash expenses	33.44	29.89	51.59
Total, cash expenses	83.38	82.99	111.60
Gross value of production less cash expenses	8.49	-7.43	29.70
Harvest-period price (dollars/bu.)	2.23	3.47	3.72
Yield (bu./planted acre)	39.76	20.53	37.07

Table 73b--Minnesota: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	88.66	71.24	137.90
Wheat straw	3.21	4.32	3.40
Total, gross value of production	91.87	75.56	141.30
Economic (full ownership) costs:			
Variable cash expenses	49.94	53.10	60.01
General farm overhead	7.89	6.41	16.96
Taxes and insurance	12.74	12.05	13.45
Capital replacement	29.77	29.48	35.71
Operating capital	0.68	0.86	1.09
Other nonland capital	5.60	6.29	8.55
Land	40.68	43.40	54.58
Unpaid labor (1989-1.2 hrs)	5.77	5.43	6.10
Total, economic costs	153.01	157.02	196.45
Residual returns to management and risk	-61.14	-81.46	-55.15
Harvest-period price (dollars/bu.)	2.23	3.47	3.72
Yield (bu./planted acre)	39.76	20.53	37.07

Table 74a--Montana: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	76.30	46.66	87.17
Wheat straw	0.64	1.10	1.00
Total, gross value of production	76.94	47.76	88.17
Cash expenses:			
Seed (64.9 lbs)	4.67	4.80	5.84
Fertilizer (23.8N, 16P, .7K lbs)	8.04	8.74	9.53
Chemicals	4.58	4.65	4.87
Custom operations	3.76	2.22	3.49
Fuel, lube, and electricity	4.69	4.39	5.03
Repairs	5.92	5.24	6.41
Hired labor	1.58	1.30	1.64
Total, variable cash expenses	33.24	31.34	36.81
General farm overhead	6.94	3.93	8.56
Taxes and insurance	6.53	5.69	7.46
Interest on operating loans	3.75	2.24	3.85
Interest on real estate	11.19	4.04	9.28
Total, fixed cash expenses	28.41	15.90	29.15
Total, cash expenses	61.65	47.24	65.96
Gross value of production less cash expenses	15.29	0.52	22.21
Harvest-period price (dollars/bu.)	2.47	3.68	3.81
Yield (bu./planted acre)	30.89	12.68	22.88

Table 74b--Montana: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	76.30	46.66	87.17
Wheat straw	0.64	1.10	1.00
Total, gross value of production	76.94	47.76	88.17
Economic (full ownership) costs:			
Variable cash expenses	33.24	31.34	36.81
General farm overhead	6.94	3.93	8.56
Taxes and insurance	6.53	5.69	7.46
Capital replacement	24.82	21.61	26.48
Operating capital	0.82	0.93	1.25
Other nonland capital	4.20	4.13	5.65
Land	20.28	13.53	22.86
Unpaid labor (1989-.7 hrs)	3.52	2.90	3.65
Total, economic costs	100.35	84.11	112.72
Residual returns to management and risk	-23.41	-36.35	-24.55
Harvest-period price (dollars/bu.)	2.47	3.68	3.81
Yield (bu./planted acre)	30.89	12.68	22.88

Table 75a--North Dakota: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	74.09	47.07	80.11
Wheat straw	1.51	3.24	2.87
Total, gross value of production	75.60	50.31	82.98
Cash expenses:			
Seed (85.1 lbs)	5.19	5.96	7.15
Fertilizer (34.1N, 18.5P, 2.1K lbs)	8.50	9.51	9.93
Chemicals	4.11	4.18	4.38
Custom operations	3.99	2.59	3.62
Fuel, lube, and electricity	4.98	4.32	5.23
Repairs	5.87	5.25	6.47
Hired labor	1.91	1.78	2.15
Technical services	0.07	0.07	0.07
Total, variable cash expenses	34.62	33.66	39.00
General farm overhead	5.76	3.52	7.13
Taxes and insurance	6.02	5.41	6.16
Interest on operating loans	3.11	1.77	4.87
Interest on real estate	6.33	3.11	6.70
Total, fixed cash expenses	21.22	13.81	24.86
Total, cash expenses	55.84	47.47	63.86
Gross value of production less cash expenses	19.76	2.84	19.12
Harvest-period price (dollars/bu.)	2.56	4.21	3.57
Yield (bu./planted acre)	28.94	11.18	22.44

Table 75b--North Dakota: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	74.09	47.07	80.11
Wheat straw	1.51	3.24	2.87
Total, gross value of production	75.60	50.31	82.98
Economic (full ownership) costs:			
Variable cash expenses	34.62	33.66	39.00
General farm overhead	5.76	3.52	7.13
Taxes and insurance	6.02	5.41	6.16
Capital replacement	20.13	18.75	23.06
Operating capital	0.43	0.53	0.67
Other nonland capital	3.66	3.77	5.25
Land	31.51	28.87	33.21
Unpaid labor (1989-.8 hrs)	4.25	3.95	4.80
Total, economic costs	106.38	98.46	119.28
Residual returns to management and risk	-30.78	-48.15	-36.30
Harvest-period price (dollars/bu.)	2.56	4.21	3.57
Yield (bu./planted acre)	28.94	11.18	22.44

Table 76a--Ohio: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	130.47	161.92	186.21
Wheat straw	37.88	83.33	53.03
Total, gross value of production	168.35	245.25	239.24
Cash expenses:			
Seed (139.8 lbs)	11.04	11.74	14.54
Fertilizer (42.6N, 58.4P, 72.3K lbs)	25.71	31.71	32.66
Lime and gypsum (.12L ton)	1.49	1.51	1.39
Chemicals	0.71	0.72	0.76
Custom operations	2.19	2.26	2.51
Fuel, lube, and electricity	6.11	5.79	6.78
Repairs	4.99	5.12	5.84
Hired labor	3.52	3.61	3.71
Miscellaneous	0.10	0.00	0.00
Technical services	0.00	0.10	0.10
Total, variable cash expenses	55.86	62.56	68.29
General farm overhead	10.05	14.72	18.30
Taxes and insurance	16.40	16.66	18.15
Interest on operating loans	5.84	7.01	8.83
Interest on real estate	12.64	17.22	17.94
Total, fixed cash expenses	44.93	55.61	63.22
Total, cash expenses	100.79	118.17	131.51
Gross value of production less cash expenses	67.56	127.08	107.73
Harvest-period price (dollars/bu.)	2.39	3.52	3.74
Yield (bu./planted acre)	54.59	46.00	49.79

Table 76b--Ohio: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	130.47	161.92	186.21
Wheat straw	37.88	83.33	53.03
Total, gross value of production	168.35	245.25	239.24
Economic (full ownership) costs:			
Variable cash expenses	55.86	62.56	68.29
General farm overhead	10.05	14.72	18.30
Taxes and insurance	16.40	16.66	18.15
Capital replacement	20.54	21.27	24.83
Operating capital	2.44	3.16	3.94
Other nonland capital	3.66	4.39	5.60
Land	67.47	102.93	96.10
Unpaid labor (1989-1.5 hrs)	7.85	8.05	8.26
Total, economic costs	184.27	233.74	243.47
Residual returns to management and risk	-15.92	11.51	-4.23
Harvest-period price (dollars/bu.)	2.39	3.52	3.74
Yield (bu./planted acre)	54.59	46.00	49.79

Table 77a--Oklahoma: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	41.40	82.71	81.58
Wheat straw	0.06	0.06	0.06
Total, gross value of production	41.46	82.77	81.64
Cash expenses:			
Seed (75.5 lbs)	5.36	4.45	5.96
Fertilizer (46.1N, 16.9P, .8K lbs)	9.93	11.91	13.16
Chemicals	1.31	1.33	1.39
Custom operations	3.83	4.44	4.32
Fuel, lube, and electricity	7.35	7.68	8.36
Repairs	5.72	6.33	7.01
Hired labor	2.69	2.81	2.89
Total, variable cash expenses	36.19	38.95	43.09
General farm overhead	2.72	5.16	6.65
Taxes and insurance	5.95	6.17	6.58
Interest on operating loans	2.36	3.58	4.65
Interest on real estate	2.14	3.39	4.29
Total, fixed cash expenses	13.17	18.30	22.17
Total, cash expenses	49.36	57.25	65.26
Gross value of production less cash expenses	-7.90	25.52	16.38
Harvest-period price (dollars/bu.)	2.30	3.35	3.87
Yield (bu./planted acre)	18.00	24.69	21.08

Table 77b--Oklahoma: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	41.40	82.71	81.58
Wheat straw	0.06	0.06	0.06
Total, gross value of production	41.46	82.77	81.64
Economic (full ownership) costs:			
Variable cash expenses	36.19	38.95	43.09
General farm overhead	2.72	5.16	6.65
Taxes and insurance	5.95	6.17	6.58
Capital replacement	17.76	19.29	22.67
Operating capital	1.40	1.67	2.15
Other nonland capital	3.12	4.06	5.08
Land	12.20	23.92	23.51
Unpaid labor (1989-1.2 hrs)	5.98	6.26	6.43
Total, economic costs	85.32	105.48	116.16
Residual returns to management and risk	-43.86	-22.71	-34.52
Harvest-period price (dollars/bu.)	2.30	3.35	3.87
Yield (bu./planted acre)	18.00	24.69	21.08

Table 78a--Oregon: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	160.96	253.38	235.75
Wheat straw	0.50	0.63	0.54
Total, gross value of production	161.46	254.01	236.29
Cash expenses:			
Seed (84.4 lbs)	8.11	7.01	8.53
Fertilizer (50.4N, 1.7P, .9K, 3.1S lbs)	12.81	12.86	14.98
Chemicals	11.83	12.02	12.60
Custom operations	2.16	2.49	2.36
Fuel, lube, and electricity	5.92	6.27	7.47
Repairs	9.69	10.31	11.25
Hired labor	2.75	2.77	2.85
Purchased irrigation water	0.09	0.09	0.09
Technical services	0.04	0.04	0.04
Total, variable cash expenses	53.40	53.85	60.17
General farm overhead	13.77	18.75	21.17
Taxes and insurance	12.99	13.55	14.44
Interest on operating loans	5.38	7.52	9.00
Interest on real estate	9.57	12.85	10.66
Total, fixed cash expenses	41.71	52.67	55.27
Total, cash expenses	95.11	106.52	115.44
Gross value of production less cash expenses	66.35	147.49	120.85
Harvest-period price (dollars/bu.)	2.57	3.74	4.16
Yield (bu./planted acre)	62.63	67.75	56.67

Table 78b--Oregon: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	160.96	253.38	235.75
Wheat straw	0.50	0.63	0.54
Total, gross value of production	161.46	254.01	236.29
Economic (full ownership) costs:			
Variable cash expenses	53.40	53.85	60.17
General farm overhead	13.77	18.75	21.17
Taxes and insurance	12.99	13.55	14.44
Capital replacement	22.26	23.62	26.32
Operating capital	2.22	2.52	3.29
Other nonland capital	3.99	4.95	5.99
Land	55.79	82.94	80.10
Unpaid labor (1989-1 hr)	6.11	6.15	6.35
Total, economic costs	170.53	206.34	217.83
Residual returns to management and risk	-9.07	47.67	18.46
Harvest-period price (dollars/bu.)	2.57	3.74	4.16
Yield (bu./planted acre)	62.63	67.75	56.67

Table 79a--South Dakota: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	68.50	36.02	78.22
Wheat straw	1.70	2.65	2.60
Total, gross value of production	70.20	38.67	80.82
Cash expenses:			
Seed (91.9 lbs)	6.43	6.34	7.63
Fertilizer (35.2N, 9.3P, 1.5K lbs)	7.86	8.69	9.88
Chemicals	4.31	4.38	4.58
Custom operations	4.00	2.06	3.54
Fuel, lube, and electricity	4.57	4.16	4.77
Repairs	5.09	4.60	5.61
Hired labor	1.99	1.91	2.26
Technical services	0.04	0.04	0.04
Total, variable cash expenses	34.29	32.18	38.31
General farm overhead	5.35	2.71	6.94
Taxes and insurance	8.45	8.01	8.99
Interest on operating loans	2.89	1.36	4.74
Interest on real estate	5.88	2.39	6.52
Total, fixed cash expenses	22.57	14.47	27.19
Total, cash expenses	56.86	46.65	65.50
Gross value of production less cash expenses	13.34	-7.98	15.32
Harvest-period price (dollars/bu.)	2.35	3.46	3.70
Yield (bu./planted acre)	29.15	10.41	21.14

Table 79b--South Dakota: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	68.50	36.02	78.22
Wheat straw	1.70	2.65	2.60
Total, gross value of production	70.20	38.67	80.82
Economic (full ownership) costs:			
Variable cash expenses	34.29	32.18	38.31
General farm overhead	5.35	2.71	6.94
Taxes and insurance	8.45	8.01	8.99
Capital replacement	16.35	14.88	18.41
Operating capital	0.72	0.87	1.12
Other nonland capital	3.21	3.28	4.57
Land	19.42	15.15	21.36
Unpaid labor (1989-.9 hr)	4.44	4.26	5.04
Total, economic costs	92.23	81.34	104.74
Residual returns to management and risk	-22.03	-42.67	-23.92
Harvest-period price (dollars/bu.)	2.35	3.46	3.70
Yield (bu./planted acre)	29.15	10.41	21.14

Table 80a--Virginia: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	89.01	156.01	149.70
Wheat straw	4.33	5.00	4.45
Total, gross value of production	93.34	161.01	154.15
Cash expenses:			
Seed (130.7 lbs)	9.41	9.93	12.28
Fertilizer (51.8N, 33P, 40K lbs)	20.09	25.22	27.56
Lime and gypsum (.05L ton)	1.07	1.04	1.08
Chemicals	0.62	0.63	0.65
Custom operations	1.56	1.63	1.73
Fuel, lube, and electricity	5.96	5.97	6.26
Repairs	5.06	5.61	6.31
Hired labor	3.37	3.32	3.43
Technical services	0.01	0.01	0.01
Total, variable cash expenses	47.15	53.36	59.31
General farm overhead	5.30	8.89	14.74
Taxes and insurance	4.90	5.33	5.67
Interest on operating loans	2.83	2.99	5.95
Interest on real estate	5.95	9.00	7.54
Total, fixed cash expenses	18.98	26.21	33.90
Total, cash expenses	66.13	79.57	93.21
Gross value of production less cash expenses	27.21	81.44	60.94
Harvest-period price (dollars/bu.)	2.53	3.45	3.55
Yield (bu./planted acre)	35.18	45.22	42.17

Table 80b--Virginia: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	89.01	156.01	149.70
Wheat straw	4.33	5.00	4.45
Total, gross value of production	93.34	161.01	154.15
Economic (full ownership) costs:			
Variable cash expenses	47.15	53.36	59.31
General farm overhead	5.30	8.89	14.74
Taxes and insurance	4.90	5.33	5.67
Capital replacement	17.33	19.16	22.08
Operating capital	1.89	2.40	3.08
Other nonland capital	3.00	3.87	4.84
Land	23.28	25.93	25.98
Unpaid labor (1989-1.6 hrs)	7.50	7.40	7.63
Total, economic costs	110.35	126.34	143.33
Residual returns to management and risk	-17.01	34.67	10.82
Harvest-period price (dollars/bu.)	2.53	3.45	3.55
Yield (bu./planted acre)	35.18	45.22	42.17



**Table 81a--Washington: Wheat production cash costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	139.32	221.68	152.00
Wheat straw	0.50	0.68	0.67
Total, gross value of production	139.82	222.36	152.67
Cash expenses:			
Seed (77.4 lbs)	7.20	8.75	8.36
Fertilizer (66N, 3.9P, 2.2K lbs)	16.41	16.68	20.43
Chemicals	8.04	8.16	8.55
Custom operations	2.34	2.48	2.39
Fuel, lube, and electricity	11.08	10.71	11.45
Repairs	10.57	10.86	10.38
Hired labor	3.03	2.90	2.64
Purchased irrigation water	0.91	0.91	0.91
Technical services	0.65	0.65	0.65
Total, variable cash expenses	60.23	62.09	65.76
General farm overhead	11.93	16.41	13.68
Taxes and insurance	9.68	9.50	9.43
Interest on operating loans	4.66	6.58	5.82
Interest on real estate	8.29	11.25	6.89
Total, fixed cash expenses	34.56	43.74	35.82
Total, cash expenses	94.79	105.83	101.58
Gross value of production less cash expenses	45.03	116.53	51.09
Harvest-period price (dollars/bu.)	2.56	3.86	4.26
Yield (bu./planted acre)	54.42	57.43	35.68

**Table 81b--Washington: Wheat production economic costs and returns per planted acre, 1987-89**

Item	1987	1988	1989
<u>Dollars</u>			
Gross value of production (excl. direct Gov't. payments):			
Wheat	139.32	221.68	152.00
Wheat straw	0.50	0.68	0.67
Total, gross value of production	139.82	222.36	152.67
Economic (full ownership) costs:			
Variable cash expenses	60.23	62.09	65.76
General farm overhead	11.93	16.41	13.68
Taxes and insurance	9.68	9.50	9.43
Capital replacement	26.30	26.08	26.04
Operating capital	2.45	2.89	3.71
Other nonland capital	4.57	5.33	5.63
Land	39.60	65.50	43.31
Unpaid labor (1989-1 hr)	6.75	6.44	5.88
Total, economic costs	161.51	194.25	173.44
Residual returns to management and risk	-21.69	28.11	-20.77
Harvest-period price (dollars/bu.)	2.56	3.86	4.26
Yield (bu./planted acre)	54.42	57.43	35.68

Table 82a--Wyoming: Wheat production cash costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	56.30	72.05	73.91
Wheat straw	0.12	0.16	0.20
Total, gross value of production	56.42	72.21	74.11
Cash expenses:			
Seed (45 lbs)	4.41	4.59	4.00
Fertilizer (1.0N lb)	0.19	0.19	0.22
Chemicals	0.19	0.19	0.20
Custom operations	1.24	0.96	1.05
Fuel, lube, and electricity	5.60	5.18	6.35
Repairs	7.23	7.13	8.07
Hired labor	1.57	1.48	1.67
Total, variable cash expenses	20.43	19.72	21.56
General farm overhead	5.09	5.94	7.20
Taxes and insurance	7.60	7.18	7.79
Interest on operating loans	2.75	3.39	3.24
Interest on real estate	8.20	6.10	7.80
Total, fixed cash expenses	23.64	22.61	26.03
Total, cash expenses	44.07	42.33	47.59
Gross value of production less cash expenses	12.35	29.88	26.52
Harvest-period price (dollars/bu.)	2.10	3.71	3.69
Yield (bu./planted acre)	26.81	19.42	20.03

Table 82b--Wyoming: Wheat production economic costs and returns per planted acre, 1987-89

Item	1987	1988	1989
	<u>Dollars</u>		
Gross value of production (excl. direct Gov't. payments):			
Wheat	56.30	72.05	73.91
Wheat straw	0.12	0.16	0.20
Total, gross value of production	56.42	72.21	74.11
Economic (full ownership) costs:			
Variable cash expenses	20.43	19.72	21.56
General farm overhead	5.09	5.94	7.20
Taxes and insurance	7.60	7.18	7.79
Capital replacement	28.55	27.80	33.18
Operating capital	0.82	0.97	1.21
Other nonland capital	4.92	5.52	7.11
Land	15.81	20.87	21.27
Unpaid labor (1989-.7 hr)	3.49	3.29	3.72
Total, economic costs	86.71	91.29	103.04
Residual returns to management and risk	-30.29	-19.08	-28.93
Harvest-period price (dollars/bu.)	2.10	3.71	3.69
Yield (bu./planted acre)	26.81	19.42	20.03

### Notes for Appendix Tables

Machine operations listed are not in sequence.

Machines used in custom field operations are excluded.

Machines are repeated because they are either of different size or pulled by different tractor horsepower, or they are in tandem with other machines.

-- = Indicates machines are self-powered or run in tandem.

NA = Not applicable.

Width = Swath or width of the area covered by the machine, which is not necessarily the structural width of the machine.

Times-over = Total acres covered in an operation divided by planted acres of the crop. Note that hours per acre are given for module builder and land farming equipment such as backhoe, disk boarder maker, ditcher, ditch closer, levee plow disk, rear-mounted blade, and quarter drain machines.

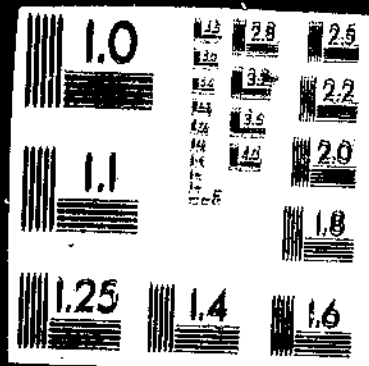
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1987-89. (STATISTICAL BULLETIN.) / M. B. ALI ECONOMIC RESEARCH  
SERVICE, WASHINGTON, DC. AGRICULTURE AND RURAL ECONOMY DIV.  
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Appendix table 1--Idaho barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.44	15	155
Flex-tine tooth harrow	.14	15	--
Liquid fertilizer spreader	.09	15	--
Moldboard plow	.19	8	115
Moldboard plow, two-way	.17	6	115
Stubble mulch plow	.10	20	185
Offset disk	.34	15	135
Spike tooth harrow	.18	15	--
Tandem disk	.23	14	115
Field cultivator	.29	23	115
Furrow-out cultivator	.03	13	75
Flex-tine tooth harrow	.16	20	95
Rod weeder	.16	37	185
Culti-packer	.42	15	135
Press drill	.25	15	--
Spike tooth harrow	.11	21	95
Fertilizer spreader mounted	.30	34	115
Liquid fertilizer spreader	.14	35	115
Anhydrous applicator	.08	42	115
Self-propelled sprayer	.19	24	--
Sprayer	.23	31	115
Grain drill	.17	17	95
Press drill	.38	18	95
Culti-packer	.08	18	--
Planter	.09	13	95
Self-propelled hillside combine	.20	18	--
Self-propelled combine	.64	19	--
Self-propelled swather	.04	15	--
Baler	.10	NA	75
Corrugator	.06	10	75

Appendix table 2--Minnesota barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.68	22	185
Moldboard plow	.52	8	155
Stubble mulch plow	.03	20	185
Offset disk	.11	25	185
Tandem disk	.11	16	100
Field cultivator	2.09	27	155
Flex-tine tooth harrow	.15	27	--
Anhydrous applicator	.11	27	--
Finishing harrow	.02	25	65
Flex-tine tooth harrow	.19	36	100
Sprayer	.13	36	--
Multi-weeder	.24	32	155
Spike tooth harrow	.07	35	85
Land-all, do-all	.06	32	185
Fertilizer spreader mounted	.18	44	115
Anhydrous applicator	.10	33	185
Self-propelled sprayer	.55	50	--
Sprayer	.21	40	65
Broadcast seeder	.01	35	85
Press drill	.95	20	100
Fertilizer trailer	.76	20	--
Grain drill	.03	11	50
Planter	.02	30	155
Self-propelled combine	.89	16	--
Self-propelled combine-row	.07	18	--
Self-propelled swather	.85	17	--
Baler	.04	NA	85
Side delivery rake	.02	11	50
Hay wagon	.04	NA	85
Rock picker	.01	7	100

Appendix table 3--Montana barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	1.93	29	185
Rod weeder	.65	29	--
Spring tooth harrow	.27	29	--
Anhydrous applicator	.10	29	--
Press drill	.06	29	--
Moldboard plow	.02	6	95
Stubble mulch plow	.15	22	155
Offset disk	.04	16	135
One-way disk	.04	22	135
Tandem disk	.05	17	35
Field cultivator	.72	28	155
Rod weeder	.36	29	135
Culti-packer	.03	13	115
Fertilizer trailer	.23	39	95
Liquid fertilizer spreader	.02	16	95
Self-propelled sprayer	.48	24	--
Sprayer	.18	40	75
Grain drill	.12	29	135
Press drill	.68	24	135
Fertilizer attachment	.36	24	--
Sprayer	.14	24	--
Self-propelled hillside combine	.02	18	--
Self-propelled combine	.85	19	--
Self-propelled swather	.14	20	--
Bale wagon	.02	NA	--
Baler	.11	NA	--
Corrugator	.01	15	55
Land plane	.01	14	95
Rock picker	.03	7	75

Appendix table 4--North Dakota barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.93	27	175
Anhydrous applicator	.20	27	--
Moldboard plow	.26	9	175
Stubble mulch plow	.10	23	135
Offset disk	.03	12	115
Tandem disk	.20	21	155
Field cultivator	1.07	28	175
Flex-tine tooth harrow	.24	28	--
Spring tooth harrow	.03	28	--
Fertilizer spreader mounted	.10	28	--
Sprayer	.05	28	--
Press drill	.18	28	--
Furrow-out cultivator	.05	19	115
Flex-tine tooth harrow	.11	40	155
Multi-weeder	.03	37	155
Spring tooth harrow	.05	40	175
Fertilizer trailer	.10	32	155
Anhydrous applicator	.20	32	175
Self-propelled sprayer	.56	50	--
Sprayer	.03	35	115
Press drill	.79	22	155
Fertilizer attachment	.36	22	--
Planter	.01	14	175
Self-propelled combine	.74	20	--
Self-propelled Combine-row	.12	18	--
Swather	.40	20	95
Self-propelled swather	.39	18	--
Baler	.05	NA	115
Hay wagon	.02	NA	75
Rock picker	.02	7	75

Appendix table 5--Pennsylvania barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.15	9	95
Disk plow	.10	20	130
Moldboard plow	.40	5	70
Offset disk	.42	14	110
Culti-packer	.08	14	--
One-way disk	.09	11	60
Broadcast seeder	.04	11	--
Tandem disk	.42	11	80
Field cultivator	.14	13	95
Planter	.06	13	--
Finishing harrow	.04	10	50
Roller-harrow	.39	11	70
Spike tooth harrow	.09	12	110
Spring tooth harrow	.08	14	60
Fertilizer trailer	.23	40	80
Anhydrous applicator	.08	40	70
Liquid fertilizer spreader	.08	40	60
Manure spreader	.21	14	80
Sprayer	.15	23	60
Press drill	.13	16	60
No-till drill	.14	12	130
Grain drill	.44	12	50
Planter	.13	18	70
Fertilizer attachment	.05	18	--
Self-propelled combine	.46	14	--
Self-propelled combine-row	.09	12	--
Baler	.57	NA	70
Hay wagon	.34	NA	--
Flail mower	.02	30	50
Side delivery rake	.03	24	110
Silage harvester	.04	7	110

Appendix table 6--South Dakota barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.62	21	175
Flex-tine tooth harrow	.10	21	--
Moldboard plow	.25	6	115
Stubble mulch plow	.14	17	135
Offset disk	.15	16	135
Tandem disk plow	.14	21	115
Tandem disk	.16	21	155
Field cultivator	.75	23	135
Flex-tine tooth harrow	.09	20	75
Multi-weeder	.04	40	225
Press drill	.07	40	--
Spike tooth harrow	.01	30	75
Disk bedder	.05	24	105
Culti-packer	.03	36	135
Anhydrous applicator	.06	41	225
Fertilizer trailer	.02	40	115
Liquid fertilizer spreader	.14	41	75
Self-propelled sprayer	.15	50	--
Sprayer	.12	40	75
Grain drill	.12	31	175
Press drill	.63	18	95
Fertilizer attachment	.12	18	--
Planter	.15	20	155
Self-propelled combine	.76	20	--
Self-propelled combine-row	.12	24	--
Swather	.12	19	95
Self-propelled swather	.40	18	--
Baler	.01	NA	75



Appendix table 7--Washington barley: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.51	20	185
Spike tooth harrow	.07	20	--
Subsoil chisel plow	.05	26	185
Disk plow	.04	18	185
Moldboard plow	.15	9	130
Stubble mulch plow	.06	25	185
Offset disk	.26	18	155
One-way disk	.03	16	115
Tandem disk	.17	25	185
Field cultivator	.92	36	185
Sprayer	.04	36	--
Finishing harrow	.10	65	185
Flex-tine tooth harrow	.33	60	185
Multi-weeder	.23	36	155
Rod weeder	.69	40	185
Spike tooth harrow	.12	47	115
Spring tooth harrow	.06	24	155
Culti-packer	.01	12	75
Fertilizer spreader mounted	.32	51	185
Anhydrous applicator	.18	50	185
Liquid fertilizer spreader	.31	51	185
Self-propelled sprayer	.06	45	--
Sprayer	.60	60	155
Broadcast seeder	.09	42	130
Grain drill	.27	26	130
Press drill	.52	33	155
No-till planter	.08	28	290
Planter	.03	31	185
Self-propelled hillside combine	.77	18	--
Self-propelled combine	.19	22	--
Self-propelled swather	.01	13	--

Appendix table 8--Alabama corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.31	12	105
Subsoil chisel plow	.28	11	150
Moldboard plow	.14	5	90
Disk plow	.96	18	135
Tandem disk plow	.18	14	125
Tandem disk	.39	9	70
Sprayer	.03	9	--
Offset disk	.56	9	50
Row cultivator	.79	10	50
Field cultivator	.22	11	70
Spike tooth harrow	.39	13	50
Rail, pipe, log, plank	.02	12	50
Disk bedder	.18	18	135
Bedder-shaper planter	.36	18	135
Fertilizer attachment	.03	28	70
Fertilizer spreader mounted	.19	12	70
Anhydrous applicator	.23	20	50
Sprayer	.59	20	50
Air drill	.18	18	90
No-till planter	.03	13	135
Planter	.79	11	90
Mower-rotary	.18	9	70
Self-propelled combine-row	.45	12	--
Self-propelled combine	.17	13	--
Stalk shredder	.05	5	70
Fertilizer trailer	.19	46	135

Appendix table 9--Illinois corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.31	11	155
Coulter chisel	.12	13	155
Moldboard plow	.18	7	135
Tandem disk	.64	18	125
Finishing harrow	.05	18	--
Spike tooth harrow	.04	18	--
Tandem disk plow	.09	20	135
One-way disk	.02	20	125
Offset disk	.07	16	135
Row cultivator	.90	20	95
Fertilizer attachment	.13	20	--
Rotary hoe	.09	19	95
Field cultivator	.71	22	155
Finishing harrow	.05	17	85
Fertilizer spreader mounted	.53	23	135
Anhydrous applicator	.17	35	155
Sprayer	.29	29	75
Planter	.82	21	95
Sprayer	.61	21	--
No-till planter	.15	18	95
Self-propelled combine	.88	18	--
Self-propelled combine	.03	16	--
Corn Picker	.02	6	85
Flail mower	.02	12	85
Hay wagon	.06	NA	135
Land-all, do-all	.08	18	115

Appendix table 10--Indiana corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Liquid fertilizer spreader	0.07	23	155
One-way disk	.05	14	95
Chisel plow	.40	14	155
Moldboard plow	.17	6	105
Coulter chisel	.08	13	155
Disk plow	.06	16	115
Tandem disk	.54	16	125
Culti-packer	.02	16	--
Tandem disk plow	.15	16	115
Offset disk	.12	19	135
Row cultivator	.66	17	95
Field cultivator	.47	19	125
Rotary hoe	.12	14	125
Finishing harrow	.18	26	155
Flex-tine tooth harrow	.05	12	155
Spring tooth harrow	.04	16	85
Land-all, do-all	.05	18	155
Fertilizer spreader mounted	.38	27	155
Anhydrous applicator	.12	32	105
Fertilizer trailer	.20	40	125
Sprayer	.29	34	95
Planter	.73	18	85
Fertilizer attachment	.12	18	--
Sprayer	.23	18	--
No-till planter	.21	19	95
Self-propelled combine	.31	16	--
Self-propelled combine-row	.58	18	--
Stalk shredder	.14	22	95
Culti-packer	.06	13	95

Appendix table 11--Iowa corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.14	6	115
Chisel plow	.22	12	155
Coulter chisel	.15	10	135
Tandem disk	.55	17	95
Spike tooth harrow	.06	17	--
Offset disk	.15	18	135
Row cultivator	1.04	17	85
Field cultivator	.84	26	155
Rotary hoe	.03	17	75
Spike tooth harrow	.06	21	55
Finishing harrow	.11	21	125
Multi-weeder	.05	24	75
Land-all, do-all	.02	22	155
Fertilizer spreader mounted	.24	23	135
Fertilizer trailer	.14	41	115
Anhydrous applicator	.15	24	155
Liquid fertilizer spreader	.09	30	115
Sprayer	.40	33	75
Planter	.71	20	95
Fertilizer attachment	.19	20	--
Anhydrous applicator	.07	20	--
Sprayer	.38	20	--
No-till planter	.22	18	105
Self-propelled combine-row	.53	18	--
Self-propelled combine	.23	16	--
Corn picker	.06	7	95
Flail mower	.02	19	115
Manure spreader	.03	14	75
Stalk shredder	.11	13	105

Appendix table 12--Kansas corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Anhydrous applicator	0.22	23	175
Chisel plow	.44	15	135
Subsoil chisel plow	.21	28	175
Fertilizer attachment	.17	28	--
Tandem disk	.89	22	135
Spike tooth harrow	.02	22	--
Offset disk	.15	21	155
Rolling cultivator	.37	21	135
Row cultivator	.50	19	105
Rotary hoe	.04	18	75
Furrow-out cultivator	.06	19	135
Field cultivator	.51	24	155
Finishing harrow	.10	30	225
Lister	.05	18	175
Bedder-shaper planter	.06	25	105
Fertilizer attachment	.07	23	175
Fertilizer trailer	.31	44	75
Fertilizer spreader mounted	.15	22	115
Sprayer	.46	34	95
Self-propelled sprayer	.03	50	--
Planter	.48	19	115
Sprayer	.08	19	--
Air planter	.10	19	105
No-till planter	.26	34	115
No-till drill	.04	23	155
Grain drill	.03	21	115
Self-propelled combine-row	.60	18	--
Self-propelled combine	.26	20	--
Shredder	.10	18	115
Land plane	.01	14	225
Moldboard plow	.01	8	115
Tandem disk plow	.08	22	135

Appendix table 13--Kentucky corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.10	3	70
Chisel plow	.54	12	105
Tandem disk	1.00	15	105
Offset disk	.95	15	95
Spike tooth harrow	.02	13	--
Field cultivator	.16	23	155
Sprayer	.15	23	--
Rotary hoe	.17	19	50
Row cultivator	.26	13	85
Rolling cultivator	.01	8	70
Finishing harrow	.02	15	135
Land-all, do-all	.01	21	155
Fertilizer trailer	.22	24	70
Fertilizer attachment	.07	38	70
Anhydrous applicator	.13	17	70
Fertilizer spreader mounted	.05	15	155
Sprayer	.39	21	70
Self-propelled sprayer	.06	30	--
Fertilizer attachment	.21	11	--
Planter	.72	11	70
No-till planter	.22	13	70
Self-propelled combine-row	.51	12	--
Self-propelled combine	.22	14	--
Combine	.05	8	70
Silage harvester	.07	6	70
Subsoil chisel plow	.06	12	105
Liquid fertilizer spreader	.02	25	50
Hay wagon	.03	NA	50

Appendix table 14--Michigan corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.40	7	85
Chisel plow	.17	12	155
Subsoil chisel plow	.03	12	185
Tandem disk	.48	14	100
Culti-packer	.04	14	--
Offset disk	.21	22	135
Field cultivator	.58	20	135
Row cultivator	.30	13	75
Spring tooth harrow	.16	13	65
Finishing harrow	.10	18	135
Multi-weeder	.03	22	135
Roller harrow	.02	12	75
Culti-packer	.08	16	100
Coulter chisel	.12	11	115
Anhydrous applicator	.11	26	135
Fertilizer spreader mounted	.06	21	115
Fertilizer trailer	.41	41	100
Liquid fertilizer spreader	.07	23	135
Sprayer	.75	31	65
Planter	.75	15	75
Fertilizer attachment	.21	15	--
Sprayer	.11	15	--
Spike tooth harrow	.04	15	--
No-till planter	.16	16	75
Rock picker	.07	7	50
Self-propelled combine-row	.70	18	--
Self-propelled combine	.08	13	--
Corn picker	.04	5	75
Hay wagon	.02	NA	100
Combine	.05	6	65
Flail mower	.01	13	100

Appendix table 15--Minnesota corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Subsoil chisel plow	0.06	12	100
Self-propelled sprayer	.02	50	--
Chisel plow	.26	15	135
Coulter chisel	.11	13	185
Moldboard plow	.37	6	100
Tandem disk	.59	15	100
Tandem disk plow	.06	14	85
Offset disk	.04	11	75
Field cultivator	1.17	19	115
Rotary hoe	.09	25	100
Rolling cultivator	.18	16	115
Harrow spike	.06	17	50
Multi-weeder	.06	31	50
Spring tooth harrow	.05	17	155
Flex-tine tooth harrow	.10	26	155
Fertilizer trailer	.20	45	100
Anhydrous applicator	.22	19	115
Liquid fertilizer spreader	.02	19	135
Fertilizer spreader mounted	.12	23	135
Sprayer	.88	35	75
Multi-weeder	.06	35	--
Planter	.90	16	75
Fertilizer attachment	.29	16	--
Sprayer	.39	16	--
Air planter	.05	17	85
No-till planter	.06	21	100
Rock picker	.06	7	65
Row cultivator	1.19	17	85
Self-propelled combine-row	.63	18	--
Self-propelled combine	.07	13	--
Corn picker	.13	6	75
Stalk shredder	.19	14	50

Appendix table 16--Missouri corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.23	13	135
Moldboard plow	.12	5	75
Disk plow	.05	18	125
Tandem disk	.58	17	125
Harrow spike	.01	17	--
Anhydrous applicator	.07	17	--
Offset disk	.69	14	135
Row cultivator	.86	16	85
Field cultivator	.77	22	155
Rotary hoe	.05	22	115
Roller packer	.02	18	125
Disk bedder	.02	19	155
Anhydrous applicator	.19	18	125
Fertilizer spreader mounted	.16	20	135
Sprayer	.31	27	95
Planter	.81	15	75
Row cultivator	.06	15	--
No-till planter	.17	15	95
Fertilizer attachment	.05	15	--
Sprayer	.14	15	--
Self-propelled combine, row	.78	12	--
Self-propelled combine	.16	16	--
Flail mower	.01	6	95
One-way disk	.01	18	135
Tandem disk plow	.03	11	55
Spring tooth harrow	.02	12	75
Fertilizer trailer	.33	31	135

Appendix table 17--Nebraska corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.16	14	115
Subsoil chisel plow	.10	14	155
Moldboard plow	.04	5	135
Tandem disk	.97	20	135
Flex-tine tooth harrow	.09	20	--
Tandem disk plow	.12	16	95
Offset disk	.07	19	115
Row cultivator	.99	17	115
Rolling cultivator	.35	17	115
Disk bedder	.08	21	115
Rotary hoe	.20	16	75
Furrow-out cultivator	.22	20	115
Field cultivator	.59	19	115
Spike tooth harrow	.07	29	75
Roller packer	.07	15	115
Anhydrous applicator	.16	19	135
Liquid fertilizer spreader	.16	24	75
Fertilizer spreader mounted	.46	22	135
Sprayer	.16	24	95
Self-propelled sprayer	.04	50	--
Planter	.64	19	95
Fertilizer attachment	.12	19	--
Sprayer	.15	19	--
Air planter	.23	16	105
No-till planter	.14	16	105
Self-propelled combine, row	.60	18	--
Self-propelled combine	.23	16	--
Corn picker	.02	6	55
Silage harvester	.02	6	175
Shredder	.33	17	135

Appendix table 18--North Carolina corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.14	4	50
Chisel plow	.48	10	95
Tandem disk	1.05	12	85
Rail, pipe, log, plank	.07	12	--
Tandem disk plow	.30	12	105
Offset disk	.39	13	105
Row cultivator	.37	10	70
Rolling cultivator	.11	7	50
Field cultivator	.03	13	95
Flex-tine tooth harrow	.02	25	105
Disk bedder	.11	9	70
Anhydrous applicator	.05	5	85
Liquid fertilizer spreader	.23	16	85
Fertilizer spreader mounted	.05	16	125
Sprayer	.85	17	85
Planter	.61	10	70
Sprayer	.23	10	--
Fertilizer attachment	.17	10	--
No-till planter	.23	16	95
Self-propelled combine-row	.55	12	--
Flail mower	.02	12	95
Subsoil chisel plow	.12	9	115
Rotary hoe	.03	11	70

Appendix table 19--Ohio corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.42	20	95
Chisel plow	.24	12	155
Coulter chisel	.08	13	135
Tandem disk	.46	13	85
Offset disk	.25	13	105
Field cultivator	.54	19	115
Flex-tine tooth harrow	.05	19	--
Culti-packer	.07	19	--
Sprayer	.07	19	--
Row cultivator	.59	17	75
Roller packer	.15	12	75
Spike tooth harrow	.10	12	85
Flex-tine tooth harrow	.03	15	95
Tandem disk plow	.04	11	55
Rotary hoe	.04	18	75
Liquid fertilizer spreader	.17	27	85
Anhydrous applicator	.23	29	105
Fertilizer spreader mounted	.31	32	85
Manure spreader	.02	14	95
Sprayer	.59	28	75
Planter	.63	17	75
No-till planter	.30	18	85
Self-propelled combine, row	.59	12	--
Self-propelled combine	.21	16	--
Combine	.07	5	75
Stalk shredder	.07	13	105
Spring tooth harrow	.03	10	85
Air planter	.04	21	75

Appendix table 20--Pennsylvania corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.56	5	80
Chisel plow	.16	11	110
Disk plow	.09	15	110
Tandem disk	.58	11	80
Culti-packer	.05	11	--
Offset disk	.58	16	95
Field cultivator	.07	8	95
Row cultivator	.09	5	60
Spring tooth harrow	.20	12	40
Finishing harrow	.10	12	95
Culti-packer	.10	11	70
Manure spreader	.37	0	110
Fertilizer attachment	.06	11	40
Fertilizer spreader mounted	.12	45	50
Anhydrous applicator	.14	27	50
Tandem disk plow	.05	11	95
Fertilizer trailer	.06	30	40
Sprayer	.71	26	70
Self-propelled sprayer	.06	14	--
Planter	.48	11	50
Sprayer	.17	11	--
Fertilizer attachment	.30	11	--
No-till planter	.36	14	70
Air planter	.07	16	95
Self-propelled combine-row	.26	12	--
Self-propelled combine	.15	14	--
Corn picker	.18	5	60
Baler	.03	NA	60
Shredder	.04	7	80
Flail mower	.15	6	95

Appendix table 21--South Dakota corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
One-way disk	0.08	22	155
Chisel plow	.28	15	155
Field cultivator	.03	15	--
Subsoil chisel plow	.03	24	175
Stubble mulch plow	.05	30	155
Moldboard plow	.21	7	95
Tandem disk	.87	17	105
Spring tooth harrow	.20	17	--
Tandem disk plow	.02	21	135
Offset disk	.07	19	175
Row cultivator	1.33	15	95
Rolling cultivator	.14	23	115
Rotary hoe	.05	19	75
Field cultivator	.89	19	135
Liquid fertilizer spreader	.05	26	55
Spike tooth harrow	.10	24	55
Flex-tine tooth harrow	.06	28	95
Anhydrous applicator	.13	35	155
Fertilizer trailer	.14	40	55
Sprayer	.20	24	95
Self-propelled sprayer	.08	50	--
Planter	.90	16	95
Liquid fertilizer spreader	.10	16	--
Fertilizer attachment	.12	16	--
Sprayer	.35	16	--
Air planter	.04	18	135
No-till planter	.02	20	135
Self-propelled combine-row	.49	18	--
Self-propelled combine	.38	16	--
Silage harvester	.02	7	105

Appendix table 22--Wisconsin corn: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.25	11	115
Moldboard plow	.80	7	100
Tandem disk	.77	13	100
Spike tooth harrow	.16	13	--
Tandem disk plow	.22	15	100
Row cultivator	.66	11	65
Field cultivator	.36	14	85
Rotary hoe	.05	16	85
Spike tooth harrow	.09	15	50
Spring tooth harrow	.23	17	85
Rolling cultivator	.06	12	85
Multi-weeder	.04	18	135
Flex-tine tooth harrow	.03	12	85
Finishing harrow	.18	19	100
Culti-packer	.10	13	85
Offset disk	.21	14	115
Land-all, do-all	.17	18	155
Manure spreader	.11	14	75
Liquid fertilizer spreader	.08	24	65
Anhydrous applicator	.08	21	115
Fertilizer spreader mounted	.10	28	135
Sprayer	.40	28	65
Planter	.98	12	65
Fertilizer attachment	.64	12	--
Sprayer	.24	12	--
No-till planter	.10	13	85
Self-propelled combine-row	.31	12	--
Self-propelled combine	.13	13	--
Corn picker	.25	6	65
Flail mower	.13	8	85
Silage harvester	.17	6	100
Stalk shredder	.09	8	85



Appendix table 23--Alabama cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.08	12	125
Disk plow	.07	16	135
Moldboard plow	.29	6	125
Moldboard plow	.43	5	150
Offset disk	.95	13	70
Tandem disk plow	.35	14	150
Tandem disk	.74	15	150
Field cultivator	.60	14	115
Row cultivator	2.65	8	115
Finishing harrow	.16	13	115
Subsoil bedder	.07	9	170
Land-all, do-all	.25	15	150
Roto-tiller	.42	10	135
Fertilizer spreader mounted	.04	11	90
Sprayer	.37	13	90
Planter	1.13	15	115
Sprayer	.26	15	--
Mower-rotary	.36	9	115
Stalk shredder	.11	6	115
Fertilizer attachment	.02	30	75
Self-propelled sprayer	1.66	27	--
Module builder	.14	8	70
Self-propelled cotton picker	1.13	7	--
Cotton trailer	1.27	6	70

Appendix table 24--Arizona cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	1.11	12	155
Anhydrous applicator	.13	12	--
Moldboard plow	.23	6	135
Moldboard plow	.54	7	135
Offset disk	1.71	14	115
Tandem disk	.11	18	155
Field cultivator	.36	8	115
Furrow-out cultivator	.20	8	115
Rotary hoe	3.70	8	115
Row cultivator	.91	6	115
Row cultivator	.15	6	--
Spike tooth harrow	.38	7	135
Lister	.94	9	135
Planter	.04	9	--
Roto-tiller	.56	8	115
Sprayer	.81	8	--
Liquid fertilizer spreader	.26	8	115
Sprayer	.17	13	155
Planter	1.40	8	95
Cotton road wagon	2.79	8	115
Land plane	1.55	14	135
Flail mower	.97	5	185
Cotton trailer	1.93	6	75
Module builder	.36	8	75
Self-propelled cotton picker	1.52	7	--

Appendix table 25--Arkansas cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.58	14	155
Disk plow	.29	21	155
Broadcast seeder	.07	21	--
Land-all, do-all	.06	21	--
Moldboard plow	.14	8	100
Offset disk	.43	12	165
Liquid fertilizer spreader	1.81	12	--
Tandem disk plow	.20	18	165
Tandem disk	.81	18	145
Field cultivator	2.10	14	145
Row cultivator	2.09	9	145
Sprayer	8.62	9	--
Row cultivator	.27	9	--
Finishing harrow	.47	10	155
Disk bedder	1.43	10	145
Land-all, do-all	.91	11	145
Fertilizer trailer	1.15	40	135
Sprayer	.61	10	145
Planter	1.11	9	125
Stalk shredder	.73	5	145
Self-propelled sprayer	1.27	26	--
Self-propelled cotton picker	1.53	7	--
Cotton trailer	1.66	7	85
Module builder	.05	8	85

Appendix table 26--California cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	1.02	10	130
Disk plow	.33	14	115
Moldboard plow	.07	14	290
Moldboard plow	.08	8	130
Offset disk	2.66	15	130
Corrugator	.30	15	--
Tandem disk	.18	17	155
Field cultivator	.50	7	95
Rotary hoe	.95	13	95
Rolling cultivator	2.26	8	115
Spike tooth harrow	.49	11	95
Sprayer	.09	11	--
Lister	1.07	9	155
Mulch treader	.26	7	115
Liquid fertilizer spreader	.47	8	115
Sprayer	.25	14	95
Planter	.02	8	115
Float	.31	12	95
Mower-rotary	.83	4	95
Self-propelled sprayer	.26	45	--
Self-propelled cotton picker	1.21	7	--
Cotton trailer	1.05	8	75
Module builder	.38	8	75

Appendix table 27--Georgia cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.07	11	115
Disk plow	.09	16	125
Moldboard plow	.02	5	90
Moldboard plow	.14	5	115
Disk bedder	.77	8	170
Tandem disk plow	.13	15	115
Tandem disk	1.80	19	135
Field cultivator	.33	7	105
Fertilizer spreader mounted	.04	7	--
Row cultivator	4.83	7	90
Land-all, do-all	.04	7	--
Sprayer	.67	7	--
Planter	.02	7	--
Finishing harrow	.69	9	105
Land-all, do-all	.01	21	125
Roto-tiller	.01	10	70
Fertilizer attachment	.08	11	105
Sprayer	1.19	14	90
Planter	.97	7	105
Stalk shredder	.09	10	105
Self-propelled sprayer	8.93	27	--
Self-propelled cotton picker	1.44	7	--
Cotton trailer	1.69	6	70
Module builder	.05	8	70

Appendix table 28--Louisiana cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.71	7	145
Disk plow	.88	9	125
Offset disk	.87	12	145
Tandem disk plow	.33	15	155
Tandem disk	.25	14	135
Field cultivator	1.74	8	115
Sprayer	4.07	8	--
Planter	.83	8	--
Row cultivator	2.13	9	135
Fertilizer spreader mounted	4.06	9	--
Finishing harrow	.40	8	85
Subsoil bedder	1.34	7	125
Land-all, do-all	.84	10	135
Land-all, do-all	.09	10	--
Liquid fertilizer spreader	.37	11	135
Sprayer	.88	20	135
Planter	1.04	8	115
Stalk shredder	.48	8	145
Self-propelled sprayer	.84	26	--
Self-propelled cotton picker	1.29	7	--
Cotton trailer	1.58	7	85

Appendix table 29--Mississippi cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.95	8	155
Disk plow	.07	16	145
Moldboard plow	.02	9	155
Offset disk	.25	11	125
Tandem disk plow	.14	19	165
Tandem disk	1.12	17	135
Field cultivator	.97	12	125
Row cultivator	2.84	9	125
Sprayer	.00	9	--
Finishing harrow	.74	11	155
Disk bedder	1.00	9	135
Fertilizer spreader mounted	1.20	9	--
Land-all, do-all	.54	9	115
Liquid fertilizer spreader	.35	11	135
Sprayer	1.11	14	115
Planter	.96	8	125
Planter	.04	8	--
Stalk shredder	.84	5	135
Self-propelled sprayer	3.59	26	--
Self-propelled cotton picker	1.34	7	--
Cotton trailer	1.44	7	85
Module builder	.14	8	85

Appendix table 30--Oklahoma cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	1.19	18	105
Disk plow	.01	21	125
Moldboard plow	.23	7	125
Moldboard plow	.07	6	135
Stubble mulch plow	.36	21	145
Offset disk	1.11	18	145
Sprayer	.09	18	--
Tandem disk	.62	11	125
Field cultivator	.99	19	125
Anhydrous applicator	.13	19	--
Rotary hoe	1.05	9	105
Row cultivator	1.18	7	105
Spring tooth harrow	.70	24	115
Bedder-shaper planter	.20	7	135
Land plane	.17	14	135
Fertilizer trailer	.07	28	105
Sprayer	.12	20	125
Planter	1.03	7	105
Mower-rotary	.68	8	105
Mounted cotton stripper	.18	3	105
Self-propelled cotton picker	.08	7	--
Self-propelled cotton stripper	.53	12	--
Module builder	.46	8	90

Appendix table 31--Tennessee cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.38	12	135
Moldboard plow	.72	6	125
Offset disk	.06	15	155
Tandem disk plow	.24	19	155
Tandem disk	1.25	17	125
Field cultivator	.63	15	115
Row cultivator	2.91	7	115
Sprayer	3.65	7	--
Finishing harrow	.10	17	125
Disk bedder	.40	8	155
Land-all, do-all	.99	13	135
Fertilizer trailer	.31	32	115
Sprayer	1.09	12	95
Planter	.98	7	105
Fertilizer spreader mounted	.29	7	--
Mower-rotary	.73	7	115
Self-propelled sprayer	.07	23	--
Self-propelled cotton picker	1.56	7	--
Cotton trailer	1.19	5	70

Appendix table 32--Texas cotton: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.73	16	135
Disk plow	.06	13	125
Moldboard plow	.13	7	155
Moldboard plow	.10	6	135
Stubble mulch plow	.10	16	135
Offset disk	.49	16	145
Offset disk	.72	16	--
Tandem disk	.43	19	155
Field cultivator	1.58	13	125
Fertilizer spreader mounted	1.03	13	--
Rotary hoe	.65	11	115
Row cultivator	1.24	11	125
Sprayer	4.05	11	--
Finishing harrow	2.13	12	125
Lister	1.29	10	125
Sandfighter	1.39	21	125
Fertilizer trailer	.33	13	155
Sprayer	.61	15	115
Planter	1.38	9	125
Cotton trailer	.34	5	90
Mounted cotton stripper	1.15	3	115
Stalk shredder	.46	7	105
Land plane	.08	14	115
Self-propelled sprayer	.28	20	--
Self-propelled cotton picker	.07	7	--
Self-propelled cotton stripper	.44	12	--
Module builder	.27	8	90

Appendix table 33--Michigan oats: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Subsoil chisel plow	0.98	10	155
Moldboard plow	.68	7	115
Offset disk	.18	11	85
Tandem disk plow	.32	13	115
Tandem disk	.34	15	115
Roller harrow	.14	15	--
Field cultivator	.29	25	155
Field cultivator	.53	17	115
Flex-tine tooth harrow	.16	12	75
Culti-packer	.05	12	--
Multi-weeder	.16	16	85
Spring tooth harrow	.36	15	85
Fertilizer trailer	.34	37	85
Sprayer	.36	26	75
Grain drill	.51	10	65
Roller harrow	.21	10	--
Fertilizer attachment	.77	10	--
Sprayer	.08	10	--
Grain drill	.51	10	65
Press drill	.17	20	65
Culti-packer	.13	20	--
Combine	.08	7	85
Self-propelled combine	.79	13	--
Side delivery rake	.06	9	50
Baler	.28	NA	50
Hay wagon	.13	NA	65

Appendix table 34--Minnesota oats: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.15	13	155
Moldboard plow	.21	5	75
Moldboard plow	.41	9	100
Tandem disk	.62	14	85
Flex-tine tooth harrow	.36	14	--
Field cultivator	.98	36	155
Field cultivator	.88	18	100
Flex-tine tooth harrow	.38	18	--
Spring tooth harrow	.60	18	--
Culti-packer	.16	18	--
Sprayer	.04	18	--
Flex-tine tooth harrow	.56	25	85
Spike tooth harrow	.34	24	50
Side delivery rake	.17	9	50
Fertilizer trailer	.27	41	75
Sprayer	.14	27	50
Broadcast seeder	.04	28	75
Grain drill	.58	14	50
Press drill	.38	14	85
Combine	.11	11	85
Swather	.23	14	65
Self-propelled sprayer	.03	50	--
Self-propelled combine	.57	13	--
Self-propelled swather	.41	13	--
Baler	.78	NA	65
Hay wagon	.89	NA	50

Appendix table 35--New York oats: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.12	12	180
Disk plow	.24	5	80
Moldboard plow	.60	7	130
Offset disk	.19	14	130
Tandem disk plow	.26	21	180
Tandem disk	.36	12	110
Roller harrow	.13	12	--
Field cultivator	.26	25	180
Roller harrow	.42	14	95
Spring tooth harrow	.68	15	95
Culti-packer	.09	15	--
Culti-packer	.33	14	95
Manure spreader	.02	14	95
Fertilizer trailer	.69	36	80
Sprayer	.37	27	50
Grain drill	.16	11	80
Grain drill	.40	18	80
Press drill	.44	14	80
Culti-packer	1.12	14	--
Fertilizer trailer	.30	14	--
Self-propelled combine	.74	14	--
Silage harvester	.16	12	180
Self delivery rake	.15	3	60
Baler	.36	NA	60
Hay wagon	1.04	NA	60
Rock picker	.05	7	95

Appendix table 36--North Dakota oats: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	1.42	24	175
Anhydrous applicator	.06	24	--
Fertilizer trailer	.12	24	--
Moldboard plow	.16	8	135
Roller-packer	.05	8	--
Press drill	.36	8	--
Offset disk	.19	17	155
Tandem disk plow	.14	15	115
Tandem disk	.09	13	115
Field cultivator	.19	28	115
Field cultivator	.51	16	135
Spring tooth harrow	.16	16	--
Spring tooth harrow	.14	29	95
Roller-packer	.03	16	95
Fertilizer attachment	.05	20	155
Anhydrous applicator	.04	26	225
Sprayer	.26	31	155
Press drill	.13	17	115
Fertilizer attachment	.24	17	--
Swather	.08	21	105
Self-propelled combine	1.00	16	--
Self-propelled swather	.44	14	--
Bale loader	.11	NA	--
Baler	.13	NA	--

Appendix table 37--Pennsylvania oats: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.23	8	95
Moldboard plow	.30	4	60
Moldboard plow	.32	9	80
Offset disk	.16	11	80
Tandem disk	.52	12	80
Spring tooth harrow	.14	12	--
Moldboard plow	.12	5	80
Tandem disk	.12	8	70
Finishing harrow	.20	12	130
Roller harrow	.32	13	95
Spring tooth harrow	.42	12	50
Culti-packer	.20	12	--
Spring tooth harrow	.19	13	80
Manure spreader	.09	14	95
Fertilizer trailer	.21	40	110
Sprayer	.37	26	60
Press drill	.44	13	50
Fertilizer attachment	1.07	14	--
Grain drill	.52	11	40
Grain drill	.16	17	40
Planter	.33	12	60
Self-propelled combine	.91	14	--
Rock picker	.04	7	40
Side delivery rake	.12	9	40
Baler	.57	NA	70
Hay wagon	.77	NA	40

Appendix table 38--Wisconsin oats: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.05	6	75
Coulter chisel	.08	10	135
Moldboard plow	.42	5	75
Moldboard plow	.18	8	115
Offset disk	.51	14	75
Tandem disk plow	.07	15	100
Tandem disk	.83	13	100
Spring tooth harrow	.42	13	--
Field cultivator	.25	12	75
Finishing harrow	.18	20	50
Roller harrow	.10	12	85
Spike tooth harrow	.30	16	50
Spring tooth harrow	.88	16	85
Culti-packer	.12	12	65
Manure spreader	.04	14	75
Fertilizer trailer	.17	38	75
Sprayer	.08	40	50
Grain drill	.68	10	50
Culti-packer	.19	10	--
Fertilizer attachment	.06	10	--
Press drill	.33	10	65
Planter	.13	10	50
Self-propelled combine	.38	13	--
Swather	.06	10	75
Baler	.30	NA	85
Hay wagon	.22	NA	50



Appendix table 39--Alabama peanut: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.12	11	90
Moldboard plow	.30	6	105
Moldboard plow	.64	6	135
Single disk	.30	14	115
Tandem disk plow	.18	15	125
Tandem disk	1.80	15	115
Offset disk	.12	16	135
Field cultivator	.85	13	70
Rotary hoe	.05	10	115
Row cultivator	1.02	14	90
Rolling cultivator	.26	15	50
Bedder-shaper planter	.10	14	135
Land-all, do-all	.04	12	135
Roto-tiller	.20	10	125
Fertilizer trailer	.07	34	105
Anhydrous applicator	.12	27	115
Sprayer	6.00	21	90
Self-propelled sprayer	.10	27	--
Planter	.71	11	90
Sprayer	.29	11	--
Bedder-shaper planter	.13	13	115
Grain drill	.05	14	90
Self-propelled combine, peanut	1.01	6	105
Digger-shaker	.13	7	90
Shaker-inverter	.88	7	105
Reshaker	.06	10	50
Mower-rotary	.11	10	115

Appendix table 40--Georgia peanut: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.12	11	90
Moldboard plow	.30	6	105
Moldboard plow	.64	6	135
Single disk	.30	14	115
Tandem disk plow	.18	15	125
Tandem disk	1.80	15	115
Offset disk	.12	16	135
Field cultivator	.85	13	70
Rotary hoe	.05	10	115
Row cultivator	1.02	14	90
Rolling cultivator	.26	15	50
Bedder-shaper planter	.10	14	135
Land-all, do-all	.04	12	135
Roto-tiller	.20	10	125
Fertilizer trailer	.07	34	105
Anhydrous applicator	.12	27	115
Sprayer	6.00	21	90
Self-propelled sprayer	.10	27	--
Planter	.71	11	90
Sprayer	.29	11	--
Bedder-shaper planter	.13	13	115
Grain drill	.05	14	90
Self-propelled combine, peanut	1.01	6	105
Digger-shaker	.13	7	90
Shaker-inverter	.88	7	105
Reshaker	.06	10	50
Mower-rotary	.11	10	115

Appendix table 41--North Carolina peanut: Average machinery use per planted acre (Database = 1967 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Subsoil chisel plow	0.10	10	135
Moldboard plow	.30	6	85
Moldboard plow	.37	8	95
Single disk	.20	14	105
Tandem disk plow	.61	15	125
Tandem disk	.99	13	85
Offset disk	.12	12	105
Field cultivator	.17	13	105
Rotary hoe	.06	12	115
Row cultivator	.79	11	85
Rolling cultivator	.10	11	70
Disk bedder	.21	16	115
Subsoil bedder	.19	14	125
Land-all, do-all	.06	12	115
Anhydrous applicator	.11	18	85
Liquid fertilizer spreader	.14	15	70
Fertilizer trailer	.27	20	95
Sprayer	4.92	16	70
Self-propelled sprayer	.65	23	--
Planter	.61	12	85
Sprayer	.63	12	--
Bedder shaper planter	.19	13	95
Fertilizer attachment	.03	13	--
Peanut combine	1.03	6	85
Shaker-inverter	.81	8	85
Reshaker	.27	16	85
Mower-rotary	.22	6	70

Appendix table 42--Oklahoma peanut: Average machinery use per planted acre (Database = 1967 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.15	6	125
Disk plow	.59	12	105
Moldboard plow	.97	6	135
Stubble mulch plow	.20	18	145
Offset disk	.17	15	135
Tandem disk	1.91	13	105
Culti-packer	.24	13	--
Field cultivator	.62	16	90
Furrow-out cultivator	.33	23	105
Rotary hoe	.61	13	90
Row cultivator	.55	12	75
Rolling cultivator	.74	18	75
Rod weeder	.12	24	135
Spring tooth harrow	.27	21	105
Bedder-shaper	.19	14	90
Anhydrous applicator	.12	33	90
Fertilizer spreader mounted	.27	47	90
Sprayer	2.05	16	75
Grain drill	.11	18	75
Side delivery rake	.19	10	75
Planter	1.04	17	90
Sprayer	.48	17	--
Peanut combine	.96	7	90
Shaker-inverter	.81	8	90
Digger-shaker	.23	8	90
Reshaker	.33	8	--
Baler	.15	NA	75

Appendix table 43--Texas peanut: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.49	12	90
Disk plow	.25	12	115
Moldboard plow	.69	6	105
Offset disk	.19	17	135
Tandem disk	1.15	13	105
Field cultivator	.51	15	90
Rotary hoe	.40	16	115
Row cultivator	.71	10	75
Rolling cultivator	.96	12	90
Rod weeder	.17	17	75
Furrow-out cultivator	.38	19	155
Spring tooth harrow	.32	23	135
Lister	.87	16	115
Culti-packer	.14	15	135
Anhydrous applicator	.24	24	105
Fertilizer trailer	.17	25	90
Sprayer	.87	16	75
Broadcast seeder	.22	25	90
Grain drill	.18	17	90
Lister planter	.18	13	105
Planter	.83	13	90
Sprayer	.37	13	--
Peanut combine	.98	7	105
Digger-shaker	.38	8	90
Shaker-inverter	.66	8	90
Reshaker	.20	9	90
Baler	.07	NA	75
Side delivery rake	.37	9	75
Mower-rotary	.18	12	125

Appendix table 44--Virginia peanut: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Subsoil chisel plow	0.07	11	125
Moldboard plow	.40	7	95
Moldboard plow	.60	7	115
Offset disk	.11	16	95
Tandem disk plow	.49	18	135
Tandem disk	1.70	15	115
Single disk	.29	14	105
Spike tooth harrow	.04	15	--
Field cultivator	.32	12	70
Rotary hoe	.23	16	85
Row cultivator	.47	14	85
Finishing harrow	.06	12	105
Subsoil bedder	.08	12	135
Land-all, do-all	.15	14	155
Culti-packer	.15	14	125
Anhydrous applicator	.18	24	85
Fertilizer trailer	.10	25	85
Fertilizer attachment	.11	28	85
Sprayer	4.92	27	70
Self-propelled sprayer	.10	23	--
Planter	.67	13	95
Broadcast seeder	.07	26	85
Bedder-shaper planter	.21	12	95
Peanut combine	.95	6	85
Shaker-inverter	.97	10	105
Reshaker	.11	12	85
Mower-rotary	.22	11	155

Appendix table 45--Arkansas (non-Delta) rice: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.07	23	160
Offset disk-heavy duty	.69	22	135
Single disk	.04	13	160
Tandem disk	1.33	24	160
Tandem disk	.48	24	--
Field cultivator	.60	24	160
Finishing harrow	.02	21	160
Flex-tine tooth harrow	.15	28	205
Spike tooth harrow	.41	24	160
Mounted spreader	.07	24	--
Spring tooth harrow	.05	31	135
Subsoiler chisel	.02	9	160
Lister	.06	26	135
Culti-packer	.65	25	135
Roto-tiller	.40	13	160
Culti-packer	.16	22	--
Mounted spreader	.04	43	160
Trailer spreader	.08	37	135
Sprayer	.03	14	85
Broadcast seeder	.41	25	135
Grain drill	.69	18	135
Culti-packer	.16	18	--
Float	.58	14	160
Land plane	.81	15	160
Levee disk	.20	8	160
Broadcast seeder	.02	8	--
Blade	.01	6	115
Self-propelled combine	.98	17	--
Rice buggy	.80	17	135

Appendix table 46--California rice: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	1.45	17	125
Moldboard plow	.22	17	175
Subsoiler chisel	.06	11	75
Single disk	.06	20	175
Offset disk-heavy duty	.93	18	125
Offset disk-light duty	.26	19	125
Tandem disk	.09	18	125
Field cultivator	.02	16	175
Flex-tine tooth harrow	.04	25	160
Spike tooth harrow	.18	28	115
Spring tooth harrow	.04	19	115
Culti-mulcher	.03	19	160
Culti-packer	.30	15	75
Sprayer	.08	15	--
Anhydrous applicator	.05	20	75
Mounted spreader	.22	20	135
Trailer spreader	.22	24	75
Sprayer	.12	21	160
Grain drill	.02	14	135
Mower	.03	10	40
Border disk	.03	9	175
Float	.07	11	125
Land plane	.97	16	125
Spike tooth harrow	.02	15	--
Levee disk	.04	8	175
Blade	.01	6	115
Self-propelled combine-track	.86	16	--
Self-propelled rice buggy	.16	16	--

Appendix table 47--Southwest Louisiana rice: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.39	22	175
Single disk	.03	21	175
Offset disk-heavy duty	.43	19	175
Offset disk-light duty	.06	14	115
Tandem disk	1.19	21	160
Field cultivator	.16	21	160
Spike tooth harrow	.11	18	160
Multi-weeder	.01	18	175
Rail, pipe, log, plank	.13	16	135
Spring tooth harrow	.05	25	175
Culti-packer	.07	17	135
Mounted spreader	.08	33	100
Trailer spreader	.05	35	135
Sprayer	.01	40	70
Grain drill	.05	13	85
Backhoe	.04	NA	85
Ditcher	.09	NA	85
Float	.20	14	175
Land plane	.45	15	175
Levee disk	.27	8	160
Self-propelled combine	.99	17	--
Rice buggy	.15	17	160

Appendix table 48--Mississippi (Delta) rice: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.10	22	205
Single disk	.10	9	135
Offset disk-heavy duty	.53	20	160
Tandem disk	1.55	23	160
Field cultivator	1.00	26	160
Sprayer	.01	26	--
Spike tooth harrow	.64	25	160
Mounted spreader	.26	25	--
Finishing harrow	.09	24	160
Flex-tine tooth harrow	.07	21	160
Rail, pipe, log, plank	.06	25	160
Flat roller	.05	27	160
Culti-packer	.27	26	135
Roto-tiller	.14	23	160
Trailer spreader	.04	33	115
Sprayer	.02	28	115
Broadcast seeder	.14	18	135
Grain drill	.92	20	160
Spring tooth harrow	.07	20	--
Backhoe	.04	NA	115
Ditcher	.02	NA	85
Float	.15	14	205
Land plane	.78	15	160
Levee disk	.26	8	160
Blade	.04	NA	135
Self-propelled combine	.85	17	--
Rice buggy	.49	17	160

Appendix table 49--Lower Texas Coast rice: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.11	18	175
Offset disk-heavy duty	1.17	20	160
Tandem disk	1.36	20	175
Field cultivator	1.85	28	175
Flex-tine tooth harrow	.19	24	175
Multi-weeder	.19	28	175
Rail, pipe, log, plank	.15	20	135
Spike tooth harrow	.43	24	135
Spring tooth harrow	.63	23	135
Flat roller	.45	33	135
Mounted spreader	.09	25	115
Grain drill	.83	16	115
Float	.13	18	160
Land plane	1.16	15	160
Levee disk	.15	8	135
Self-propelled combine	1.47	16	--
Rice buggy	1.36	16	135

Appendix table 50--Upper Texas Coast rice: Average machinery use per planted acre (Database = 1988 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.24	26	160
Single disk	.12	15	135
Offset disk-heavy duty	1.48	17	175
Offset disk-light duty	.11	18	135
Tandem disk	1.58	18	175
Field cultivator	1.00	23	160
Rotary hoe	.05	30	175
Multi-weeder	.18	21	135
Rail, pipe, log, plank	.48	22	135
Spike tooth harrow	1.09	23	160
Culti-packer	.27	28	175
Anhydrous applicator	.02	15	175
Mounted spreader	.04	20	70
Trailer spreader	.10	28	135
Sprayer	.03	20	115
Broadcast seeder	.09	24	160
Grain drill	.19	17	135
Land plane	.33	15	175
Levee disk	.10	8	135
Self-propelled combine	1.02	16	--
Rice buggy	.71	16	160

Appendix table 51--Arkansas grain sorghum: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.22	13	115
Subsoil chisel plow	.17	13	145
Tandem disk	1.96	20	145
Offset disk	.14	18	135
Disk plow	.01	11	100
Field cultivator	.36	20	125
Liquid fertilizer spreader	.01	20	--
Row cultivator	1.09	18	125
Sprayer	.16	18	--
Spike tooth harrow	.07	16	135
Spring tooth harrow	.17	30	180
Sprayer	.16	30	--
Roller harrow	.22	16	115
Finishing harrow	.03	15	100
Subsoil bedder	.15	16	125
Land-all, do-all	.58	19	155
Fertilizer spreader mounted	.42	40	125
Fertilizer trailer	.67	38	125
Fertilizer attachment	.03	40	85
Sprayer	.39	26	155
Self-propelled sprayer	.16	26	--
Grain drill	.04	13	135
Broadcast seeder	.01	17	85
Sprayer	.01	17	--
Planter	.98	18	125
Self-propelled combine	.24	19	--
Self-propelled combine-row	.73	18	--
Mower-rotary	.02	10	85
Land plane	.10	14	180
Float	.02	12	85

Appendix table 52--Kansas grain sorghum: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Stubble mulch plow	0.41	21	135
Anhydrous applicator	.04	21	--
Offset disk plow	.52	17	115
Moldboard plow	.03	9	135
Chisel plow	.22	13	115
Anhydrous applicator	.02	13	--
Fertilizer spreader mounted	.02	13	--
Subsoil chisel plow	.07	17	135
Tandem disk	.99	18	115
Flex-tine tooth harrow	.07	18	--
Field cultivator	.79	24	135
Row cultivator	.31	14	95
Rolling cultivator	.09	14	95
Sprayer	.01	14	--
Rotary hoe	.07	15	95
Furrow-out cultivator	.05	19	115
Spring tooth harrow	.22	30	115
Flex-tine tooth harrow	.03	30	--
Rod weeder	.02	22	95
Lister	.02	14	95
Fertilizer spreader mounted	.02	31	135
Anhydrous applicator	.31	25	135
Fertilizer trailer	.12	50	115
Sprayer	.13	27	75
Grain drill	.06	14	75
Press drill	.02	24	135
Planter	.52	13	75
Fertilizer attachment	.07	13	--
Sprayer	.04	13	--
No-till planter	.25	15	105
Fertilizer attachment	.05	22	--
Air planter	.10	18	135
Self-propelled combine	.65	20	--
Self-propelled combine-row	.08	10	--
Mower-rotary	.08	10	155

Appendix table 53--Missouri grain sorghum: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.14	6	95
Chisel plow	.31	10	125
Tandem disk	1.44	18	115
Spike tooth harrow	.05	18	--
Offset disk	.19	21	135
Stubble mulch plow	.01	15	115
Field cultivator	.59	15	115
Row cultivator	.35	12	85
Rolling cultivator	.05	15	105
Spike tooth harrow	.03	16	135
Spring tooth harrow	.07	12	75
Roller harrow	.08	16	125
Finishing harrow	.08	20	135
Disk bedder	.09	15	155
Fertilizer spreader mounted	.25	30	75
Anhydrous applicator	.02	5	135
Sprayer	.22	15	95
Grain drill	.07	11	115
Planter	.67	18	75
Sprayer	.03	18	--
No-till planter	.08	18	115
Air planter	.03	15	75
Self-propelled combine	.61	20	--
Self-propelled combine-row	.13	18	--
Land plane	.04	14	155

Appendix table 54--Texas grain sorghum: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.05	4	105
Moldboard plow	.05	7	105
Chisel plow	.37	16	155
Stubble mulch plow	.24	28	180
Subsoil chisel plow	.09	16	155
Disk plow	.10	19	135
Tandem disk	.52	18	125
Offset disk	.49	12	125
One-way disk	.04	26	115
Field cultivator	1.02	19	115
Row cultivator	.47	15	105
Rolling cultivator	.16	15	105
Rotary hoe	.02	29	180
Spring tooth harrow	.03	30	155
Finishing harrow	.20	19	135
Rod weeder	.08	17	135
Lister	.85	16	125
Liquid fertilizer spreader	.10	16	--
Disk bedder	.10	20	105
Bedder-shaper planter	.36	15	115
Sandfighter	.12	56	115
Fertilizer spreader mounted	.02	30	115
Anhydrous applicator	.10	15	145
Fertilizer trailer	.07	17	115
Sprayer	.05	30	115
Self-propelled sprayer	.03	20	--
Grain drill	.05	20	105
Planter	.79	16	115
Lister planter	.15	16	115
Self-propelled combine	.08	18	--
Self-propelled combine-row	.44	18	--
Mower-rotary	.54	10	105
Float	.05	12	105



Appendix table 55--Alabama soybean: Average machinery use per planted acre (Database = 1987 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.45	6	115
Chisel plow	.79	10	90
Subsoil chisel plow	.01	12	135
Tandem disk	1.45	13	90
Offset disk	.03	17	125
Field cultivator	.05	16	115
Row cultivator	1.43	14	70
Finishing harrow	.08	14	125
Land-all, do-all	.03	13	135
Fertilizer trailer	.01	16	135
Fertilizer attachment	.12	25	70
Self-propelled sprayer	.09	27	--
Sprayer	1.80	21	50
Grain drill	.03	13	105
Press drill	.16	13	50
Planter	.80	13	70
Fertilizer attachment	.08	13	--
No-till planter	.01	15	135
Self-propelled combine-row	.98	12	--

Appendix table 56--Arkansas soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.69	17	165
Subsoil chisel plow	.13	14	180
Tandem disk	1.40	21	155
Sprayer	.88	21	--
Liquid fertilizer spreader	.06	21	--
Field cultivator	.66	20	165
Row cultivator	1.01	20	135
Rolling cultivator	.01	25	145
Rotary hoe	.04	15	135
Spike tooth harrow	.07	19	135
Roller harrow	.12	21	155
Land-all, do-all	.26	17	145
Fertilizer spreader mounted	.02	21	145
Fertilizer trailer	.06	21	145
Sprayer	.58	23	100
Grain drill	.22	13	85
No-till drill	.10	24	155
Planter	.63	20	125
Self-propelled combine-row	.98	18	--
Land plane	.11	20	155

Appendix table 57--Georgia soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.01	7	105
Chisel plow	.68	16	170
Tandem disk	2.23	22	170
Offset disk	.05	21	135
Field cultivator	.67	11	105
Spike tooth harrow	.01	18	125
Disk bedder	.32	4	125
Land-all, do-all	.01	14	125
Fertilizer spreader mounted	.04	45	150
Sprayer	.57	40	125
Planter	.80	16	125
Fertilizer spreader mounted	.01	16	--
Bed shaper planter	.05	12	90
Sprayer	.08	12	--
No-till planter	.08	12	150
Self-propelled combine-row	1.12	12	--
Land plane	.23	14	105

Appendix table 58--Illinois soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.23	7	125
Chisel plow	.31	12	155
Tandem disk	1.05	19	135
Spike tooth harrow	.01	19	--
Spring tooth harrow	.02	19	--
Sprayer	.08	19	--
Offset disk	.08	19	125
Field cultivator	1.06	23	155
Fertilizer spreader mounted	.04	23	--
Sprayer	.11	23	--
Planter	.01	23	--
Row cultivator	1.30	17	105
Rotary hoe	.25	18	105
Roller harrow	.01	16	135
Finishing harrow	.06	24	155
Culti-packer	.05	16	105
Sprayer	.04	16	--
Fertilizer spreader mounted	.01	32	75
Fertilizer trailer	.06	36	105
Sprayer	.08	23	85
Field cultivator	.03	23	--
Sprayer	.20	30	75
Field cultivator	.04	30	--
Self-propelled sprayer	.02	50	--
Grain drill	.05	12	95
Planter	.71	17	95
Offset disk	.01	17	--
Field cultivator	.03	17	--
Fertilizer spreader mounted	.02	17	--
Sprayer	.26	17	--
No-till planter	.02	15	95
Air planter	.20	22	125
Self-propelled combine-row	.96	18	--
Mower-rotary	.02	10	105
Flail mower	.04	10	135

Appendix table 59--Indiana soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.05	7	105
Chisel plow	.47	13	155
Tandem disk	1.02	16	105
Spike tooth harrow	.07	16	--
Culti-packer	.07	16	--
Offset disk	.09	12	75
Field cultivator	.64	21	155
Planter	.11	21	--
Row cultivator	1.05	13	155
Rotary hoe	.13	16	75
Spike tooth harrow	.02	20	105
Finishing harrow	.08	25	155
Fertilizer spreader mounted	.05	40	75
Fertilizer trailer	.04	32	105
Sprayer	.49	30	85
Self-propelled sprayer	.05	50	--
Grain drill	.02	13	75
Press drill	.06	20	115
Planter	.65	15	85
Fertilizer attachment	.10	15	--
Sprayer	.21	15	--
No-till planter	.08	13	95
Fertilizer attachment	.01	13	--
Air planter	.05	5	85
Self-propelled combine-row	.94	18	--
Flail mower	.06	10	125

Appendix table 60--Iowa soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.18	6	115
Chisel plow	.31	12	155
Tandem disk	1.17	19	135
Tandem disk	.01	19	--
Offset disk	.07	20	135
Field cultivator	1.05	23	135
Sprayer	.34	23	--
Row cultivator	1.29	16	105
Rotary hoe	.15	20	95
Spike tooth harrow	.05	24	95
Spring tooth harrow	.03	19	135
Finishing harrow	.10	20	115
Anhydrous applicator	.02	40	155
Fertilizer trailer	.02	32	85
Sprayer	.53	29	95
Field cultivator	.01	29	--
Planter	.01	29	--
Self-propelled sprayer	.07	50	--
Grain drill	.01	28	155
Press drill	.01	15	105
Planter	.77	17	95
No-till planter	.02	15	105
Air planter	.19	21	105
Self-propelled combine-row	.76	18	--
Mower-rotary	.18	10	155
Flail mower	.02	10	115

Appendix table 61--Kentucky soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.11	4	50
Chisel plow	.15	8	85
Tandem disk	.65	13	85
Field cultivator	.19	9	70
Row cultivator	.21	6	50
Finishing harrow	.05	24	135
Liquid fertilizer spreader	.04	30	155
Fertilizer trailer	.02	12	50
Sprayer	.39	24	50
Self-propelled sprayer	.24	23	--
Sprayer	.17	17	70
Grain drill	.02	13	50
Broadcast seeder	.05	20	155
Planter	.29	7	50
No-till planter	.35	29	155
Self-propelled combine-row	.70	12	--

Appendix table 62--Louisiana soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.01	15	125
Chisel plow	.20	21	180
Disk plow	1.08	21	180
Tandem disk	1.21	21	165
Tandem disk plow	.04	19	165
Offset disk	.04	24	180
Field cultivator	.45	21	180
Sprayer	.10	21	--
Row cultivator	.54	20	165
Spike tooth harrow	.01	21	135
Spring tooth harrow	.03	25	155
Finishing harrow	.09	21	180
Rail, pipe, log, plank	.13	19	115
Bedder-shaper planter	.02	17	135
Planter	.07	17	--
Subsoil bedder	.33	16	125
Land-all, do-all	.48	20	180
Fertilizer spreader mounted	.04	46	85
Broadcast seeder	.02	46	--
Liquid fertilizer spreader	.12	21	145
Field cultivator	.12	21	--
Fertilizer trailer	.47	30	180
Sprayer	.60	20	180
Tandem disk	.09	37	--
Sprayer	.02	32	135
Grain drill	.26	16	100
Spike tooth harrow	.01	16	--
No-till drill	.01	16	165
Broadcast seeder	.01	27	115
Planter	.80	21	180
Sprayer	.10	21	--
Self-propelled combine-row	1.02	18	--
Land plane	.02	14	180

Appendix table 63--Minnesota soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.41	15	115
Chisel plow	.54	15	135
Tandem disk	.73	16	100
Finishing harrow	.01	16	--
Field cultivator	1.38	45	135
Spike tooth harrow	.02	45	--
Flex-tine tooth harrow	.12	45	--
Sprayer	.30	45	--
Row cultivator	1.00	16	75
Rotary hoe	.10	24	100
Spike tooth harrow	.09	24	65
Spring tooth harrow	.10	43	115
Flex-tine tooth harrow	.04	20	155
Multi-weeder	.15	34	155
Anhydrous applicator	.01	36	135
Fertilizer spreader mounted	.04	33	135
Sprayer	.57	25	85
Self-propelled sprayer	.58	50	--
Sprayer	.07	23	135
Grain drill	.20	13	85
Press drill	.27	25	85
Planter	.46	16	85
No-till planter	.04	25	155
Disk bedder	.01	25	--
Air planter	.04	15	100
Fertilizer attachment	.02	15	--
Self-propelled combine-row	.93	12	--
Mower-rotary	.02	10	100
Flail mower	.15	10	100
Tandem disk	.10	13	--
Rock picker	.02	7	85

Appendix table 64--Mississippi soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Chisel plow	0.17	13	165
Subsoil chisel plow	.56	13	100
Sprayer	.53	13	--
Tandem disk	1.71	17	125
Offset disk	.16	22	155
Disk plow	.05	12	115
Field cultivator	.65	16	135
Row cultivator	1.20	6	100
Spike tooth harrow	.24	8	85
Finishing harrow	.17	16	145
Disk bedder	.07	7	85
Bedder-shaper planter	.13	6	85
Land-all, do-all	.23	18	100
Fertilizer spreader mounted	.18	14	115
Fertilizer trailer	.32	36	115
Fertilizer attachment	.03	40	85
Disk bedder	.46	19	145
Self-propelled sprayer	.12	26	--
Grain drill	.24	16	145
Planter	.76	6	100
Fertilizer attachment	.16	6	--
Sprayer	.70	6	--
Self-propelled combine-row	.80	18	--
Mower-rotary	.01	10	85

Appendix table 65--Missouri soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.04	7	85
Chisel plow	.54	13	125
Tandem disk	.74	17	115
Offset disk	.38	16	115
Field cultivator	.59	21	115
Field cultivator	.02	21	--
Sprayer	.36	21	--
Row cultivator	1.05	16	85
Rotary hoe	.03	16	55
Spike tooth harrow	.06	17	115
Spring tooth harrow	.31	13	135
Roller harrow	.10	13	115
Fertilizer spreader mounted	.06	18	95
Sprayer	.35	21	95
Self-propelled sprayer	.21	50	--
Sprayer	.02	44	--
Grain drill	.10	15	105
Press drill	.08	15	95
No-till drill	.01	12	135
Planter	.58	16	85
Sprayer	.03	16	--
Air planter	.20	16	55
Fertilizer attachment	.03	16	--
Self-propelled combine-row	.71	18	--

Appendix table 66--North Carolina soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.04	5	70
Moldboard plow	.09	6	85
Chisel plow	.65	9	105
Tandem disk	1.74	13	105
Chisel plow	.01	13	--
Tandem disk	.01	13	--
Planter	.01	13	--
Offset disk	.22	18	135
Spike tooth harrow	.11	18	--
Fertilizer spreader mounted	.05	18	--
Sprayer	.06	18	--
Field cultivator	.23	11	50
Row cultivator	.98	13	70
Spike tooth harrow	.37	19	105
Roller harrow	.01	12	85
Rail, pipe, log, plank	.03	22	135
Field cultivator	.01	18	50
Lister	.03	20	135
Disk bedder	.28	15	135
Fertilizer spreader mounted	.03	18	50
Sprayer	.89	13	50
Grain drill	.10	9	70
Planter	.65	12	50
Fertilizer spreader mounted	.01	12	--
Sprayer	.09	12	--
Bed-shaper planter	.09	13	105
Sprayer	.11	13	--
No-till planter	.12	23	85
Self-propelled combine-row	.55	12	--
Sickle mower	.05	10	70
Side delivery rake	.06	10	50
Baler	.05	NA	135

Appendix table 67--Ohio soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.35	7	105
Chisel plow	.32	11	155
Tandem disk	.56	16	115
Spike tooth harrow	.02	16	--
Offset disk	.06	12	125
Field cultivator	.76	19	135
Culti-packer	.02	19	--
Row cultivator	.42	14	85
Sprayer	.03	14	--
Rotary hoe	.12	18	95
Spike tooth harrow	.11	18	105
Roller harrow	.05	12	85
Grain drill	.02	12	--
Culti-packer	.73	17	95
Fertilizer spreader mounted	.04	18	125
Fertilizer trailer	.14	38	105
Sprayer	.25	27	55
Grain drill	.21	13	75
Sprayer	.02	13	--
Press drill	.35	26	115
No-till drill	.02	10	85
Planter	.36	14	85
No-till planter	.01	10	55
Air planter	.05	17	115
Self-propelled combine-row	.98	18	--

Appendix table 68--Tennessee soybean: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.01	6	105
Chisel plow	.38	13	115
Tandem disk	1.80	21	135
Fertilizer spreader mounted	.01	21	--
Offset disk	.04	14	135
Field cultivator	.30	16	115
Row cultivator	.45	28	155
Finishing harrow	.07	11	155
Culti-packer	.02	15	155
Press drill	.01	15	--
Land-all, do-all	.53	18	155
Fertilizer spreader mounted	.03	35	115
Sprayer	1.09	24	125
Self-propelled sprayer	.06	23	--
Grain drill	.08	13	70
Press drill	.02	15	105
No-till drill	.15	14	85
Planter	.15	19	115
Fertilizer attachment	.02	19	--
No-till planter	.58	18	155
Sprayer	.35	18	--
Self-propelled combine-row	.91	18	--
Mower-rotary	.01	10	135

Appendix table 69--Colorado wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.07	11	115
Moldboard plow, two-way	.01	9	95
Chisel plow	.55	22	155
Stubble mulch plow	1.43	22	135
Subsoil chisel plow	.02	34	290
Tandem disk plow	.05	23	185
Tandem disk	.44	18	135
Offset disk	.10	22	135
One-way disk	.22	23	135
Field cultivator	.18	31	155
One-way disk	.07	33	155
Furrow-out cultivator	.02	35	185
Spring tooth harrow	.15	32	135
Finishing harrow	.02	13	95
Multi-weeder	.04	35	135
Rod weeder	1.05	27	135
Disk bedder	.01	13	135
Anhydrous applicator	.20	21	135
Fertilizer attachment-planter	.27	27	135
Liquid fertilizer spreader	.03	49	115
Sprayer	.06	26	75
Grain drill	.33	20	75
Press drill	.63	26	135
Self-propelled combine	.25	22	--
Baler	.01	NA	55
Bale wagon	.01	NA	55
Flail mower	.03	15	115

Appendix table 70--Idaho wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.10	5	95
Moldboard plow, two-way	.10	10	115
Chisel plow	.04	13	115
Subsoil chisel plow	.16	14	135
Tandem disk	.49	14	115
Offset disk	.40	16	115
Field cultivator	.17	28	155
Spike tooth harrow	.12	28	--
Furrow-out cultivator	.04	11	75
Spike tooth harrow	.18	17	95
Roller harrow	.28	13	115
Rod weeder	.47	35	185
Multi-weeder	.18	36	185
Subsoil bedder	.08	12	135
Culti-packer	.09	17	115
Grain drill	.11	17	--
Fertilizer spreader mounted	.15	38	115
Trailer fertilizer	.23	33	115
Anhydrous applicator	.07	32	95
Liquid fertilizer spreader	.10	45	185
Sprayer	.42	38	95
Self-propelled sprayer	.10	24	--
Grain drill	.41	14	75
Press drill	.26	17	115
Fertilizer attachment	.06	17	--
No-till drill	.05	19	185
Planter	.16	11	95
Self-propelled combine	.59	16	--
Self-propelled hillside combine	.31	18	--
Self-propelled swather	.03	15	--
Baler	.08	NA	95
Bale wagon	.04	NA	75
Corrugator	.08	11	95



Appendix table 71--Illinois wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.05	6	85
Chisel plow	.04	12	155
Tandem disk	1.38	17	105
Offset disk	.17	26	155
Spike tooth harrow	.11	26	--
Field cultivator	.09	20	125
Spike tooth harrow	.03	18	75
Finishing harrow	.08	13	155
Culti-packer	.03	14	155
Fertilizer spreader mounted	.08	36	135
Fertilizer trailer	.39	40	85
Manure spreader	.01	14	85
Grain drill	.72	11	85
Press drill	.11	13	95
No-till drill	.05	14	95
Fertilizer attachment	.05	14	--
Broadcast seeder	.04	12	55
Planter	.01	16	75
Self-propelled combine	.71	16	--
Side delivery rake	.01	10	85
Baler	.16	NA	95
Mower rotary	.01	6	85

Appendix table 72--Kansas wheat: Average machinery use for planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.45	10	105
Chisel plow	.19	17	135
Stubble mulch plow	.46	20	135
Flex-tine tooth harrow	.01	20	--
Roller packer	.12	20	--
Anhydrous applicator	.10	20	--
Tandem disk	1.00	20	115
Field cultivator	.01	20	--
Offset disk plow	.15	16	225
Offset disk	.82	7	135
Field cultivator	.58	27	135
Spike tooth harrow	.07	21	105
Spring tooth harrow	.82	25	105
Flex-tine tooth harrow	.12	27	155
Rod weeder	.07	24	115
Fertilizer trailer	.07	41	55
Anhydrous applicator	.25	28	115
Fertilizer attachment	.04	19	225
Sprayer	.01	19	--
Sprayer	.15	32	105
Grain drill	.57	19	95
Fertilizer attachment	.26	19	--
Press drill	.45	21	105
Self-propelled combine	.63	20	--
Baler	.01	NA	135
Swather	.01	16	135

Appendix table 73--Minnesota wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.46	9	155
Chisel plow	.49	19	185
Tandem disk	.23	19	135
Offset disk	.04	23	155
Field cultivator	2.00	26	155
Anhydrous applicator	.10	26	--
Flex-tine tooth harrow	.08	26	--
Spike tooth harrow	.07	35	100
Spring tooth harrow	.25	40	115
Flex-tine tooth harrow	.21	49	100
Finishing harrow	.01	39	135
Multi-weeder	.21	40	185
Fertilizer spreader mounted	.02	14	135
Anhydrous applicator	.60	43	100
Field cultivator	.06	31	155
Fertilizer attachment	.11	26	--
Sprayer	.49	37	115
Self-propelled sprayer	.45	50	65
Grain drill	.38	17	--
Sprayer	.06	17	85
Finishing harrow	.21	17	--
Press drill	.63	17	--
Fertilizer attachment	.37	17	115
Self-propelled combine	.88	16	--
Combine	.11	14	--
Self-propelled swather	.67	13	115
Swather	.06	19	--
Side delivery rake	.07	15	100
Baler	.11	15	100
Rock picker	.03	NA	100
		7	135

Appendix table 74--Montana wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.06	8	185
Chisel plow	2.12	30	185
Tandem disk	.04	30	--
Spike tooth harrow	.04	30	--
Spring tooth harrow	.04	30	--
Multi-weeder	.08	30	--
Rod weeder	.49	30	--
Press drill	.18	30	--
Sprayer	.09	30	--
Stubble mulch plow	.22	22	185
Flex-tine tooth harrow	.05	22	--
Subsoil chisel plow	.04	25	185
Tandem disk	.09	23	155
Field cultivator	.67	31	185
Fertilizer spreader mounted	.03	31	--
Row cultivator	.30	43	290
Flex-tine tooth harrow	.01	31	135
Multi-weeder	.26	47	290
Rod weeder	.07	34	135
Anhydrous applicator	.05	35	185
Sprayer	.21	61	155
Self-propelled sprayer	.21	24	--
Sprayer	.50	40	--
Grain drill	.03	21	95
Press drill	.76	28	155
Field cultivator	.04	28	--
Fertilizer attachment	.29	28	--
Planter	.01	48	115
Self-propelled combine	.88	22	--
Self-propelled swather	.01	15	--
Baler	.07	NA	115
Rock picker	.01	7	55

Appendix table 75--North Dakota wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.17	11	175
Chisel plow	1.27	26	175
Flex-tine tooth harrow	.11	26	--
Anhydrous applicator	.19	26	--
Stubble mulch plow	.02	22	135
Tandem disk	.14	22	175
Press drill	.19	22	--
Offset disk plow	.03	17	155
Field cultivator	1.54	27	155
Spring tooth harrow	.05	27	--
Spring tooth harrow	.05	45	155
Harrow-spike	.07	47	115
Flex-tine tooth harrow	.04	46	115
Sprayer	.06	46	--
Multi-weeder	.04	33	155
Rock picker	.05	7	55
Sprayer	.50	42	55
Self-propelled sprayer	.29	50	--
Fertilizer spreader mounted	.14	46	95
Grain drill	.12	17	105
Press drill	.59	21	135
Fertilizer attachment	.29	21	--
Fertilizer spreader mounted	.15	21	--
Planter	.13	19	135
Self-propelled combine	.85	20	--
Combine	.06	19	135
Self-propelled swather	.43	18	--
Swather	.14	20	95
Baler	.06	NA	105
Hay wagon	.03	NA	105

Appendix table 76--Ohio wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.17	5	125
Chisel plow	.03	10	105
Tandem disk	1.14	17	105
Multi-weeder	.01	17	--
Grain drill	.01	17	--
Offset disk	.03	20	105
Field cultivator	.24	17	105
Harrow-spike	.06	22	115
Flex-tine tooth harrow	.04	12	95
Multi-weeder	.01	14	75
Roller packer	.02	12	75
Culti-packer	.03	12	85
Fertilizer spreader mounted	.28	22	75
Fertilizer trailer	.32	37	75
Self-propelled sprayer	.03	50	--
Grain drill	.73	13	75
Press drill	.19	13	85
No-till drill	.01	10	85
Planter	.04	11	55
No-till planter	.01	30	115
Self-propelled combine	.90	16	--
Self-propelled hillside combine	.07	18	--
Mower-rotary	.02	8	55
Side delivery rake	.03	18	85
Baler	.13	NA	95
Rake-wheel	.02	7	55
Mower-conditioner	.01	8	75

Appendix table 77--Oklahoma wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.17	10	135
Chisel plow	.60	19	155
Stubble mulch plow	1.42	21	145
Subsoil chisel plow	.02	19	180
Disk plow	.14	19	145
Tandem disk	.32	17	115
Offset disk	.90	20	180
Field cultivator	.28	26	155
Row cultivator	.08	19	145
Spike tooth harrow	.01	20	125
Spring tooth harrow	.52	25	125
Rod weeder	.03	26	180
Bedder-shaper planter	.16	27	180
Culti-packer	.02	13	75
Mulch treader	.10	30	180
Fertilizer spreader mounted	.10	18	90
Anhydrous applicator	.12	35	125
Fertilizer trailer	.11	32	105
Fertilizer attachment	.02	21	155
Sprayer	.47	34	180
Grain drill	.61	19	105
Press drill	.38	26	145
Self-propelled combine	.60	18	--
Baler	.02	NA	125
Mower-rotary	.02	10	90

Appendix table 78--Oregon wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.58	11	95
Chisel plow	.27	26	130
Stubble mulch plow	.65	21	130
Tandem disk	.25	13	75
Offset disk	.30	18	130
Field cultivator	.59	38	155
Rotary hoe	.04	40	75
Spike tooth harrow	.03	22	55
Spring tooth harrow	.29	39	130
Flex-tine tooth harrow	.38	38	75
Multi-weeder	.07	27	290
Rod weeder	2.28	41	130
Culti-packer	.09	16	155
Grain drill	.01	16	--
Anhydrous applicator	.73	48	95
Liquid fertilizer spreader	.07	45	95
Fertilizer spreader mounted	.05	29	55
Sprayer	.47	57	130
Grain drill	.18	14	75
Press drill	.70	34	95
Planter	.09	26	115
Self-propelled combine	.34	17	--
Self-propelled hillside combine	.52	18	--
Baler	.01	NA	75
Corrugator	.01	10	95

Appendix table 79--South Dakota wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.29	9	95
Press drill	.12	9	--
Chisel plow	.78	17	155
Flex-tine tooth harrow	.09	17	--
Stubble mulch plow	.05	15	55
Tandem disk	.52	18	115
Grain drill	.01	18	--
Offset disk plow	.08	16	175
Field cultivator	.62	20	135
Spike tooth harrow	.01	38	75
Spring tooth harrow	.03	26	55
Flex-tine tooth harrow	.03	24	55
Fertilizer trailer	.18	50	95
Fertilizer spreader mounted	.02	45	95
Anhydrous applicator	.02	30	95
Sprayer	.16	42	75
Self-propelled sprayer	.17	50	--
Grain drill	.16	16	95
Planter	.04	14	115
Press drill	.55	17	115
Fertilizer attachment	.09	17	--
No-till planter	.04	20	135
No-till drill	.03	20	175
Self-propelled combine	.60	16	--
Combine	.15	12	75
Self-propelled swather	.34	14	--
Swather	.07	16	75
Baler	.02	NA	135
Bale loader	.01	NA	55
Rock picker	.01	7	95

Appendix table 80--Virginia wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.26	3	85
Chisel plow	.16	7	85
Tandem disk	1.04	9	70
Offset disk	.20	8	70
Roller harrow	.06	19	135
Culti-packer	.02	25	155
Land-all, do-all	.16	6	50
Fertilizer spreader mounted	.17	11	85
Liquid fertilizer spreader	.05	28	95
Fertilizer truck-attachment	.10	36	--
Sprayer	.04	30	85
Self-propelled sprayer	.06	41	--
Grain drill	.53	9	70
No-till drill	.20	11	70
Broadcast seeder	.18	30	50
Self-propelled combine	.50	14	--
Self-propelled combine-hill	.14	18	--
Combine	.32	7	70
Mower-rotary	.03	16	155
Baler	.03	NA	95

Appendix table 81--Washington wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.06	7	115
Chisel plow	.46	17	130
Stubble mulch plow	.25	27	290
Subsoil chisel plow	.27	17	290
Tandem disk	.66	21	155
Offset disk	.17	15	115
Field cultivator	.59	34	155
Flex-tine tooth harrow	.07	34	--
Spring tooth harrow	.05	34	--
Liquid fertilizer spreader	.09	34	--
Rotary hoe	.07	25	95
Spike tooth harrow	.45	53	95
Roller harrow	.02	12	95
Press drill	.03	12	--
Finishing harrow	.04	29	185
Multi-weeder	.14	39	290
Rod weeder	1.28	44	185
Lister	.01	20	130
Culti-packer	.02	15	185
Anhydrous applicator	.55	49	185
Liquid fertilizer spreader	.21	50	185
Fertilizer attachment	.10	31	75
Field cultivator	.02	31	--
Sprayer	.43	60	95
Grain drill	.35	29	115
Press drill	.50	31	130
No-till drill	.06	35	95
Planter	.05	12	290
Self-propelled combine	.34	22	--
Self-propelled hillside combine	.68	18	--
Baler	.01	NA	55

Appendix table 82--Wyoming wheat: Average machinery use per planted acre (Database = 1986 FCRS)

Type of machinery	Times-over per acre	Width (feet)	Tractor horsepower
Moldboard plow	0.87	16	155
Chisel plow	.18	16	155
Stubble mulch plow	1.72	46	290
Tandem disk	.08	15	115
Offset disk	.01	19	155
Field cultivator	1.08	38	290
Spring tooth harrow	.01	29	95
Rod weeder	.14	28	155
Anhydrous applicator	.01	29	135
Liquid fertilizer spreader	.01	42	155
Sprayer	.03	43	--
Self-propelled sprayer	.83	24	--
Grain drill	.02	12	75
Press drill	.96	32	290
Planter	.01	16	185
Self-propelled combine	1.00	19	--
Mower-rotary	.01	14	185
Land plane	.01	14	185
Corrugator	.02	8	155

Appendix table 83--Sample size, by crop and by State

State	Barley (1987)	Corn (1987)	Cotton (1987)	Oats (1988)	Peanuts (1987)	Rice (1988)	Sorghum (1986)	Soybean (1986)	Wheat (1986)
	----- Number of farms -----								
Alabama	--	34	52	--	75	--	--	51	--
Arizona	--	--	53	--	--	--	--	--	--
Arkansas	--	--	76	--	--	114	41	87	--
California	--	--	62	--	--	90	--	--	--
Colorado	--	--	--	--	--	--	--	--	--
Georgia	--	--	32	--	67	--	--	--	40
Idaho	65	--	--	--	--	--	--	44	--
Illinois	--	108	--	--	--	--	--	--	102
Indiana	--	74	--	--	--	--	--	109	36
Iowa	--	85	--	--	--	--	--	86	--
Kansas	--	33	--	--	--	--	--	90	--
Kentucky	--	64	--	--	--	--	67	--	57
Louisiana	--	--	57	--	--	--	--	32	--
Michigan	--	74	--	33	--	116	--	52	--
Minnesota	52	63	--	34	--	--	--	--	--
Mississippi	--	--	73	--	--	--	--	81	32
Missouri	--	52	--	--	--	103	--	54	--
Montana	65	--	--	--	--	--	31	59	--
Nebraska	--	49	--	--	--	--	--	--	102
New York	--	--	--	32	--	--	--	--	--
North Carolina	--	52	--	--	59	--	--	--	--
North Dakota	85	--	--	41	--	--	--	54	--
Ohio	--	102	--	--	--	--	--	--	84
Oklahoma	--	--	44	--	41	--	--	88	42
Oregon	--	--	--	--	--	--	--	--	60
Pennsylvania	42	42	--	37	--	--	--	--	53
South Dakota	33	62	--	--	--	--	--	--	--
Tennessee	--	--	60	--	--	--	--	--	37
Texas	--	--	141	--	56	116	52	42	--
Virginia	--	--	--	--	68	--	--	--	--
Washington	61	--	--	--	--	--	--	--	30
Wisconsin	--	94	--	73	--	--	--	--	53
Wyoming	--	--	--	--	--	--	--	--	31

-- = Indicates State not included in the USDA's Farm Costs and Returns Survey for the costs-of-production version, or number of farms surveyed was less than 30.

Number in the parentheses is the survey year on which cost-of-production estimates are based.

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