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Characteristics and Production Costs of U. S. Wheat Farms, 1989

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Farm Costs & Returns Survey

In this report...*Producing a bushel of wheat cost U.S. farmers an average of $2.07 in variable cash expenses in 1989. Individual farm costs ranged from less than $1.37 to more than $3.49 per bushel. Wheat acreage, yields, and regional differences among producers influenced wheat production costs. Differences in regional production practices and adverse weather conditions were major influences on production costs and yields. Dry weather and warm temperatures reduced already low subsoil moisture levels throughout the Plains in 1989, resulting in lower wheat yields. Low snowfall and low temperatures caused freeze damage in some parts of the Central and Southern Plains region (CO, KS, NE, OK, and TX), resulting in that region's accounting for 64 percent of all farms in the high-cost group (USDA, ERS, 1992b).*

Since high-cost wheat farms were more diversified than low-cost farms, wheat contributed less to their total farm income. Low-cost producers were concentrated in the North-Central (IL, IN, MO, NY, OH, and PA) and Northern Plains regions (ND, SD, MN, MT, and WY). Other wheat production regions included the Southeast (AL, AR, GA, LA, MS, NC, SC, and VA) and the Pacific (AZ, CA, ID, NM, and WA).

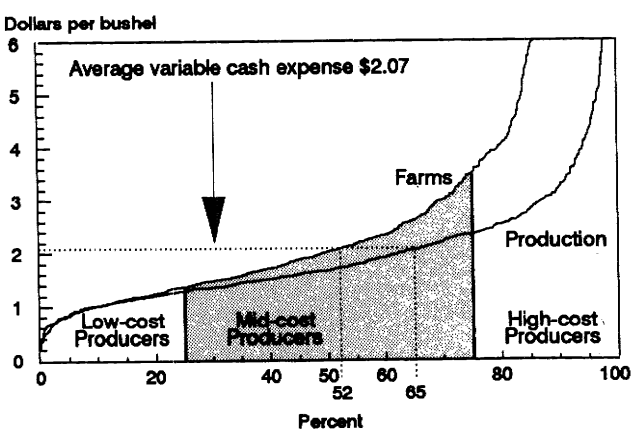
Although there was close to a 7-percent decline in 1989 winter wheat production from 1988, the decline was more than offset by increased production of spring and durum wheat, increasing total wheat production by nearly 12 percent for the year. About a fourth of the winter wheat acreage planted was not harvested in 1989, compared with less than 19 percent for all wheat classes (USDA, NASS, 1990).

This report compares selected farm characteristics and production costs among wheat producers. Producers are grouped according to variable cash expenses for wheat production, production region, and enterprise size (see Glossary). Data are from the 1989 Farm Costs and Returns Survey (FCRS) of U.S wheat farms. Responses represented 189,877 farms producing 1.27 billion bushels of wheat on about 51.8 million acres (62 percent of U.S. wheat production and 68 percent of planted acreage; USDA, NASS, 1990). Nonresponse and survey design limitations restricted full coverage of U.S. wheat farms and production.

The average variable cash expense of producing wheat on FCRS farms was $53 per acre, or $2.07 per bushel, in 1989. Estimated variable cash expenses were converted to a per-bushel basis and ranked from lowest to highest to form a weighted cumulative distribution of farms and production (fig. 1). Wheat farms were divided into three groups, according to their level of variable cash expenses. The low-cost group was the 25 percent of farms with the lowest variable costs, and the high-cost group was the 25 percent with the highest variable costs.

Figure 1
Cumulative distribution of wheat variable cash expenses, 1989

About 52 percent of FCRS wheat farms had variable cash expenses at or below the average cost of $2.07 per bushel, while 65 percent of the total wheat harvest was produced at or below the average variable cash expense.



Source: 1989 Farm Costs and Returns Survey.

Costs Varied Among Wheat Producers

Differences in per-acre costs and yields and enterprise size distinguished low- and high-cost producers. The contribution of wheat to total farm income was also a factor.

Twenty-five percent of wheat farms surveyed had variable cash expenses per bushel of $1.37 or less. These low-cost producers accounted for about 31 percent of total FCRS wheat production (table 1). High-cost producers, with per-bushel variable cash expenses of $3.49 or more, accounted for only 8 percent of the total wheat production.

Per-bushel cost was influenced by the relative cost level and yield. High-cost producers had an average yield of 7 bushels of wheat per planted acre, compared with 38 bushels per planted acre for low-cost producers.[1] The difference between actual per-planted acre and expected per-harvested acre yields indicates to what extent uncontrollable factors, such as weather, affect yields. The expected yield represents the wheat yield normally attained based on past yields. The actual yield for high-cost producers was 22 bushels per acre below what was expected, while low-cost producers surpassed their expected yield in 1989 by an average of 8 bushels. Low-cost producers had average variable cash expenses per acre of $41.26 (table 2). Expenses per planted acre were $58.47 for mid-cost producers and $50.85 for high-cost producers. Expenses for fertilizers, chemicals, custom operations, fuel, lubrication, electricity, and hired labor varied the most among the cost groups.

Enterprise and farm size also distinguished low- from high-cost producers. Low-cost producers planted less acreage to wheat than high-cost producers (219 versus 291 acres) and operated smaller farm acres (1,348 versus 1,535 acres) (table 1). About 49 percent of high-cost producers had farm sales less than $40,000, compared with 25 percent of low-cost producers. However, the farm value of production for both cost groups indicated that wheat was not as large a component of total farm income for high-cost producers (7 percent) as for low-cost producers (22 percent). Only 44 percent of high-cost producers considered their farm operations to be primarily cash grain farms, compared with 69 percent of low-cost producers (appendix table 1).

[1] Yields per planted acre were used since costs are estimated for a planted acre and costs are incurred on all acres planted.

On average, 51 percent ($53,166) of total variable costs for high-cost producers was related to livestock expenses, compared with 18 percent ($13,545) for low-cost producers (appendix table 4).

Regional growing conditions were important factors influencing the composition of wheat cost groups. Since wheat yields for many of the FCRS farms in the Central and Southern Plains were adversely affected by weather in 1989, farms in this region constituted 64 percent of all high-cost farms, and 24 percent of low-cost farms (fig. 2). North-Central producers accounted for 36 percent of low-cost farms and 8 percent of high-cost farms. The Northern Plains region accounted for 29 percent of low-cost farms and 14 percent of high-cost farms.

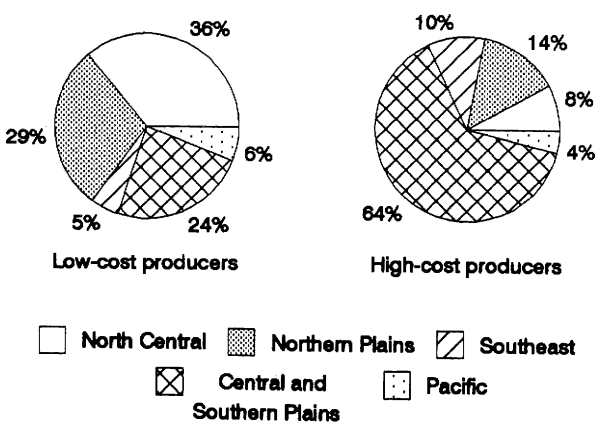
Other facts:

- The low-cost group accounted for about 31 percent of total FCRS wheat production, while high-cost producers accounted for only 8 percent of the total production.

- Nearly half of the high-cost farmers (48 percent) considered themselves livestock producers, compared with a fourth of low-cost farmers.

Figure 2
Distribution of cost groups, by region, 1989

The Central and Southern Plains had the largest share of high-cost farms.



Source: 1989 Farm Costs and Returns Survey.

Table 1--Characteristics of FCRS wheat farms, by variable cash expense group, 1989

Low-cost producers had high yields on less wheat acreage.

Item	Unit	Cost group			All FCRS farms
		Low-cost producers	Mid-cost producers	High-cost producers	
Share of FCRS:					
Wheat farms	percent	25	50	25	100
Wheat production	percent	31	61	8	100
Wheat yield (actual)	bushels/acre	38	28	7	24
Wheat yield (expected)	bushels/acre	30	25	29	27
Size:					
Total acreage operated	acres	1,348	1,399	1,535	1,421
Planted wheat acreage	acres	219	290	291	273
Sales class--[1]					
$0-$39,999	percent of farms	25	27	49	32
$40,000-$99,999	percent of farms	29	27	22	26
$100,000-$249,999	percent of farms	23	18	9	17
$250,000-$499,999	percent of farms	21	23	16	21
$500,000 or more	percent of farms	2	5	4	4
Wheat grain value of production	dollars	31,288	31,135	8,098	25,347
Wheat straw value of production	dollars	771	381	198	432
Farm value of production	dollars	146,517	160,475	122,802	148,946

[1] Data may not add due to rounding or omission of possible categories.

Table 2--Wheat production costs and returns per acre, by variable cash expense group, 1989

Average variable cash expenses for low-cost producers were $9.59 per acre less than for high-cost producers. Mid-cost producers had the highest per-acre variable cash production costs.

Item	Cost group			All FCRS farms
	Low-cost producers	Mid-cost producers	High-cost producers	
		Dollars		
Costs per bushel:				
Variable cash expenses, actual yield	1.10	2.06	5.84	2.07
Costs and returns per acre:				
Value of production[1]	147.01	108.31	28.53	94.51
Total variable cash expense	41.26	58.47	50.85	53.00
Seed	7.32	8.50	6.33	7.68
Fertilizer	12.10	19.38	14.78	16.69
Chemicals	3.93	5.91	4.08	5.02
Custom operations	2.50	4.53	4.32	4.07
Fuel, lube, and electricity	6.34	7.94	9.19	7.96
Repairs	5.98	6.44	6.58	6.39
Hired labor	2.96	5.51	5.30	4.95
Purchased irrigation water	0.12	0.21	0.23	0.20
Technical services	0.01	0.05	0.04	0.04
Returns above variable cash expenses	105.75	49.84	-22.32	41.51

[1] Value of production is estimated using yields reported in the FCRS and State-level wheat harvest-month prices published by NASS.

Farm Characteristics and Production Costs Varied by Enterprise Size

Producers planting 200 or more acres of wheat accounted for 84 percent of total production.

The 64 percent of the 1989 FCRS wheat farms with fewer than 200 acres of wheat accounted for only 16 percent of total production. Only 8 percent of the farms had 800 or more wheat acres, but they accounted for about 43 percent of production. About 36 percent of the FCRS wheat farms had over 200 acres of wheat and they accounted for 84 percent of the total production (table 3).

Farms with fewer than 50 wheat acres had the highest average yield, 36 bushels per planted acre, while farms with 800 or more acres of wheat had the lowest average yield, 26 bushels per planted acre. Producers with 50-199 acres of wheat averaged 32 bushels per acre, and farms in the 200-399 and 400-799 acre groups both averaged 27 bushels of wheat per acre. Weather and other yield-influencing factors were not important since there was little difference between actual and expected yields among the enterprise size groups.

Variable cash expenses differed by enterprise size group (table 4). Farms with fewer than 50 wheat acres had both the lowest average variable costs per bushel ($1.83) and the highest costs per acre ($72.46). Farms with 800 or more wheat acres had both the highest variable costs per bushel ($2.18), and the lowest average total variable costs per acre ($46.45). With the exception of the 400-799 acre size group, as wheat acres increased, per-acre expenses decreased. However, as size increased, per-bushel costs increased. Farms in the lowest size groups spent more for seed, fertilizer, and custom operations than farms in the larger size groups.

The size of the wheat enterprise was related to the size of the total farm operation. As the acres planted to wheat increased, average total farm acres operated increased and the ratio of wheat acres to total farm acres increased. Farms in the smallest size group averaged 24 acres of wheat as part of 377 operated acres, or about 6 percent of the farm acreage. Farms in the largest size group averaged 1,385 acres of wheat as part of 4,249 operated acres, or 33 percent of the farm acreage (table 3). Eighty percent of the farms with fewer than 50 wheat acres had farm sales of less than $100,000. Conversely, 86 percent of farms with 800 or more acres had sales of $100,000 or more.

Wheat accounted for only 5 percent of value of production for the smallest size group, compared with 34 percent of the value of farm production for the largest size group.

The percentage of operator-owned acres decreased as enterprise size increased (appendix table 2). Sixty-three percent of the wheat acres in the smallest enterprise size group were planted on operator-owned land, compared with 38 percent of the acres for the largest size group. The percentage of cash- and share-rented wheat acres increased as enterprise size increased. Share-rent arrangements often reflect an attempt by the producer to shift part of the production risk to the landlord.

Other facts:

- Twenty-eight percent of farms in the smallest size group did not consider farming to be their major occupation.

- Farms with fewer than 50 wheat acres put less acreage in fallow (15 percent), grazed livestock on fewer acres (8 percent), and double cropped wheat with other crops more (18 percent).

- Farms with 800 or more wheat acres put more acreage in fallow (68 percent), grazed livestock on more acres (23 percent), and double cropped wheat with other crops less (7 percent).

- Farms in the smallest size group planted 21 percent of the wheat acres on land previously planted to wheat, while farms in the largest size group planted 72 percent of the wheat acres on previous wheat land.

- Farm size was related to differences in regional production practices.

- Average farm debt-to-asset ratio increased with farm size.

- Two percent of the farms in the smallest size group were in vulnerable financial positions, while the largest size group had 6 percent in a vulnerable financial position (appendix table 2) (see Glossary).

Table 3--Characteristics of FCRS wheat farm operations, by enterprise size, 1989

FCRS farms with 800 or more acres accounted for 8 percent of total farms and 43 percent of total production.

Item	Unit	Enterprise size (acres)					All FCRS farms
		Fewer than 50	50-199	200-399	400-799	800 or more	
Share of FCRS:							
Wheat farms	percent	27	37	16	12	8	100
Wheat production	percent	2	14	16	25	43	100
Wheat yield (actual)	bushels/acre	36	32	27	27	26	24
Wheat yield (expected)	bushels/acre	37	30	27	26	20	27
Size:							
Total operated acreage	acres	377	1,136	1,795	2,136	4,249	1,421
Planted wheat acreage	acres	24	102	281	550	1,385	273
Sales class--[1]							
$0-$39,999	percent of farms	57	36	17	7	d	32
$40,000-$99,999	percent of farms	23	27	29	33	13	26
$100,000-$249,999	percent of farms	12	13	18	27	29	17
$250,000-$499,999	percent of farms	6	22	31	24	41	21
$500,000 or more	percent of farms	2	2	5	9	16	4
Wheat grain value of production	dollars	3,411	11,571	28,682	55,100	105,335	25,347
Wheat straw value of production	dollars	287	546	502	418	297	432
Farm value of production	dollars	78,970	124,425	186,610	218,184	306,568	148,946

d = insufficient data for disclosure.

[1] Data may not add due to rounding or omission of possible categories.

Table 4--Wheat production costs and returns per acre, by enterprise size, 1989

Farms with fewer than 50 acres of wheat had both the lowest average variable costs per bushel ($1.83) and the highest costs per acre ($72.46). Farms with 800 or more wheat acres had both the highest variable costs per bushel ($2.18) and the lowest average total variable costs per acre ($46.45).

Item	Enterprise size (acres)					All FCRS farms
	Fewer than 50	50-199	200-399	400-799	800 or more	
			Dollars			
Costs per bushel:						
Variable cash expenses, actual yield	1.83	1.93	1.98	2.10	2.18	2.07
Costs and returns per acre:						
Value of production[1]	153.41	119.23	103.89	100.90	76.25	94.51
Total variable cash expenses	72.46	61.03	54.93	56.77	46.45	53.00
Seed	11.73	9.35	8.48	7.68	6.62	7.68
Fertilizer	29.77	23.14	18.52	18.11	12.43	16.69
Chemicals	4.64	4.11	4.00	5.78	5.27	5.02
Custom operations	8.69	5.54	4.95	3.71	3.23	4.07
Fuel, lube, and electricity	7.12	8.46	7.91	8.41	7.60	7.96
Repairs	5.78	6.70	5.95	6.88	6.20	6.39
Hired labor	4.24	3.21	4.59	6.02	5.05	4.95
Purchased irrigation water	0.45	0.49	0.47	0.15	0.01	0.20
Technical services	0.04	0.03	0.06	0.03	0.04	0.04
Returns above variable cash expenses	80.95	58.20	48.96	44.13	29.80	41.51

[1] Value of production is estimated using yields reported in the FCRS and State-level wheat harvest-month prices published by NASS.

Regional Factors Influenced Wheat Production Costs

Regional differences in production practices and growing conditions contributed to yield and cost differences. Weather conditions adversely affected wheat yields in the Central and Southern Plains.

States were grouped into production regions according to their most common production culture characteristics, such as soil type, weather, production practices, and prevalent wheat class (fig. 4) (see Glossary). Farms in the Central and Southern Plains accounted for 35 percent of total wheat farms and 44 percent of wheat production (table 5). Northern Plains farms accounted for 25 percent of FCRS farms and 37 percent of total production, and the North-Central region accounted for 25 percent of the FCRS farms and 7 percent of total production. The Southeast region represented 5 percent of the 1989 FCRS wheat crop, and the Pacific region represented 7 percent. According to the U.S. crop production estimates in the States comprising each region, the wheat version of the FCRS represented 56, 65, 51, 68, and 88 percent of the 1989 wheat production of the North Central, Northern Plains, Southeast, Central and Southern Plains, and the Pacific regions, respectively (USDA, NASS, 1990).

Weather conditions adversely affected wheat yields, especially in the Central and Southern Plains region. About a third of the FCRS wheat acres planted in this region were not harvested for grain. The importance of yield in determining cost groups on a per-bushel basis was reflected by the large number (46 percent) of Central and Southern Plains farms in the high-cost group (fig. 3). Twenty-nine percent of the farms in the Southeast were in the high-cost group, compared with 8 percent in the North-Central region, 14 percent in the Northern Plains, and about 17 percent in the Pacific region. Ninety-two percent of farms in the North-Central region and 71 percent of farms in the Southeast region had fewer than 50 wheat acres. These two regions comprised about 62 percent of all farms in that size group.

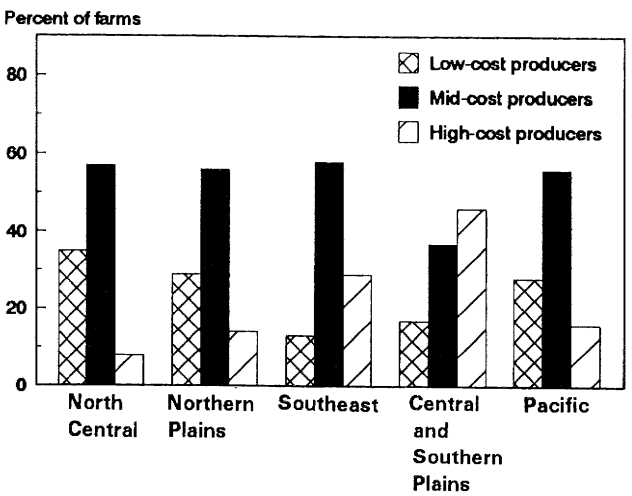
The North-Central region had the lowest variable cash expense per bushel of wheat ($1.53) (table 6). The Central and Southern Plains had the highest costs per bushel ($2.55) and one of the lowest variable cash expenses per acre ($44.89). The Northern Plains had the lowest per-acre variable cash expense ($44.19). Specific costs varied widely across regions and reflected differences in production practices and growing conditions.

Production practices varied across regions and were important factors contributing to cost differences. In the Northern Plains, where soil moisture is a limiting factor for wheat production, 90 percent of the wheat acres were in wheat-fallow rotations. By contrast, 43 percent of the wheat acres in the North Central region and 90 percent in the Southeast region were double-cropped. Sixty-five percent of wheat acres in the North-Central region and 52 percent in the Southeast were previously planted to soybeans, while more than 70 percent of the wheat acres in the Central and Southern Plains region were planted on land previously planted to wheat. Grazing livestock on wheat acres or feeding wheat grain to livestock are common practices in the Central and Southern Plains, where 38 percent of the FCRS wheat acres were grazed by livestock. In the Pacific region, 23 percent of the wheat acres were irrigated. For some farms in the North Central and Southeast regions, revenue from wheat straw was almost as important as that from the grain.

Figure 3

Distribution of cost groups, by region, 1989

Nearly 50 percent of farms in the Central and Southern Plains region were in the high-cost group.



Source: 1989 Farm Costs and Returns Survey.

Table 5--Characteristics of FCRS wheat farm operations, by region, 1989

Regional differences in production practices and growing conditions contributed to yield and cost differences.

Item	Unit	Region					All FCRS farms
		North-Central	Northern Plains	South-east	Central and Southern Plains	Pacific	
Share of FCRS:							
Wheat farms	percent	25	25	9	35	6	100
Wheat production	percent	7	37	5	44	7	100
Wheat yield (actual)	bushels/acre	51	24	33	16	49	24
Wheat yield (expected)	bushels/acre	53	12	43	34	50	27
Size:							
Total operated acreage	acres	549	1,994	893	1,626	2,363	1,421
Planted wheat acreage	acres	72	401	156	342	360	273
Sales class--[1]							
$0-$39,999	percent of farms	26	16	18	33	13	21
$40,000-$99,999	percent of farms	22	29	14	24	17	21
$100,000-$249,999	percent of farms	17	27	18	15	17	19
$250,000-$499,999	percent of farms	28	23	36	23	30	28
$500,000 or more	percent of farms	7	5	14	5	23	11
Wheat grain value of production	dollars	13,854	34,887	18,963	20,852	72,918	25,347
Wheat straw value of production	dollars	970	333	239	167	400	432
Farm value of production	dollars	126,938	110,352	215,478	140,362	367,441	148,946

[1] Data may not add due to rounding or omission of possible categories.

Table 6--Wheat production costs and returns per acre, by region, 1989

The North-Central region had the lowest costs per bushel of wheat ($1.53) and the Central and Southern Plains had the highest costs ($2.55).

Item	Region					All FCRS farms
	North-Central	Northern Plains	South-east	Central and Southern Plains	Pacific	
	Dollars					
Costs per bushel:						
Variable cash expenses, actual yield	1.53	1.86	2.43	2.55	2.00	2.07
Costs and returns per acre:						
Value of production[1]	206.43	87.74	122.97	61.47	203.74	94.51
Total variable cash expenses	79.88	44.19	83.62	44.89	99.51	53.00
Seed	13.47	7.47	13.27	5.63	11.84	7.68
Fertilizer	44.99	10.84	36.67	13.05	28.16	16.69
Chemicals	2.36	6.40	5.72	2.80	13.33	5.02
Custom operations	5.39	2.46	7.67	4.51	5.71	4.07
Fuel, lube, and electricity	6.02	7.00	6.38	7.73	16.83	7.96
Repairs	4.18	6.35	5.81	6.61	7.66	6.39
Hired labor	3.46	3.58	8.04	4.50	13.62	4.95
Purchased irrigation water	0.00	0.01	0.00	0.05	2.30	0.20
Technical services	0.01	0.08	0.06	0.01	0.06	0.04
Returns above variable cash expenses	126.55	43.55	39.35	16.58	104.23	41.51

[1] Value of production is estimated using yields reported in the FCRS and State-level wheat harvest-month prices published by NASS.

Glossary

Current ratio is calculated by dividing current assets by current liabilities.

Durum wheat is the hardest of all U.S. wheats. Durum provides semolina for spaghetti, macaroni, and other pasta products. This is a spring-seeded wheat. The subclasses are Hard Amber Durum, Amber Durum, and Durum.

Debt-to-asset ratio is calculated by dividing total liabilities by total assets.

Enterprise size categories are specified as farms with under 50 wheat acres, 50-199 acres, 200-399 acres, 400-799 acres, and 800 acres or more.

Expected yield is the yield per acre farmers reported that they normally attained by growing wheat on their operation.

Financial position describes the financial health of a farm business from a combination of income (net farm income) and solvency (debt/asset ratio) measures. Farms are categorized into one of four classes:

- ***Favorable***--positive income and debt/asset ratio less than 0.40. These farms are generally considered financially stable.

- ***Marginal income***--negative income and debt/asset ratio less than 0.40. Periods of negative income may not pose financial difficulties if these farms are carrying a low debt load and can either borrow against equity or obtain income from off-farm sources.

- ***Marginal solvency***--positive income and debt/asset ratio above 0.40. A high debt/asset ratio may be acceptable if these farms can generate enough income to service their debt and meet other financial obligations.

- ***Vulnerable***--negative income and a debt/asset ratio above 0.40. These farms are generally considered financially unstable.

Hard Red Winter wheat is an important bread wheat with good milling and baking characteristics. There are no subclasses.

Hard Red Spring wheat is an important bread wheat with the highest protein content of all wheat classes. It has good milling and baking characteristics. The subclasses are based on the dark, hard, and vitreous contents. The subclasses are Dark Northern Spring, Northern Spring, and Red Spring.

High-cost producers are the 25 percent of wheat producers with the highest per-bushel total variable costs. Those producers had variable costs per bushel of $3.49 or more.

Low-cost producers are the 25 percent of wheat producers with the lowest per-bushel total variable costs. Those producers had variable costs per bushel of $1.37 or less.

Per-acre and per-bushel costs are weighted averages. Costs per acre are weighted by total acres and costs per bushel are weighted by total production (in bushels).

Production specialty is the farm production classification that represents the largest portion of gross commodity receipts from the farm operation.

Soft Red Winter wheat is a high-yielding, low-protein wheat that provides flour for cakes, pastries, quick breads, crackers, and snack foods. This is a fall-seeded wheat. There are no subclasses.

Total economic costs are long-term costs that account for all production inputs, without regard to the ownership or equity position of farm operators. Included are variable cash expenses, general farm overhead, taxes and insurance, capital replacement, as well as opportunity costs for owned inputs (operating capital, nonland capital, land, and unpaid labor).

Total variable cash expenses represent the amount of money spent during the production process for inputs used in the production of wheat. Variable cash expenses include seed, fertilizer, chemicals, custom operations, fuel, lubrication, electricity,

repairs, hired labor, purchased irrigation water, and technical services.

Variable costs represent the costs for purchased inputs that are consumed in one production period. Variable costs depend on the chosen production practices, input quantities and qualities, and input prices.

Value of production is an estimate of the total value of all farm products produced on a farm, excluding the value of the intermediate products, such as corn fed to livestock. Specifically, for the wheat enterprise, the value of production includes both wheat grain and straw.

Wheat class is the term used by Official Grain Standards of the United States for the seven basic classes of wheat grown in the United States. Wheats are grouped as Hard Red Spring, Hard Red Winter, Durum, Soft Red Winter, White, Mixed, and Unclassed. Classes are determined by growing season, kernel hardness, and color (Heid, 1979; Reitz, 1976).

Wheat farms represent those selected in the 1989 Farm Costs and Returns Survey, Wheat Costs of Production version. Wheat farms are defined as farm operations that planted wheat for grain with the intent of harvesting the grain.

Wheat production regions are groups of States with common cultural practices in growing wheat. The North Central includes IL, IN, MO, NY, OH, and PA; the Northern Plains includes ND, SD, MN, MT, and WY; the Southeast includes AL, AR, GA, LA, MS, NC, SC, and VA; the Southern and Central Plains includes CO, KS, NE, OK, and TX; and the Pacific includes AZ, CA, ID, NM, OR, and WA (fig. 4).

White wheat is a preferred wheat for noodles, flat breads, and bakery products other than loaf bread. This class includes both fall- and spring-seeded varieties. The subclasses include Hard White, Soft White, White Club, and Western White.

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Appendix table 1--Characteristics of FCRS wheat farm operations, by cost group, 1989

Item	Unit	Cost group			All FCRS farms
		Low-cost producers	Mid-cost producers	High-cost producers	
Share of FCRS:					
Wheat farms	percent	25	50	25	100
Wheat production	percent	31	61	8	100
Wheat acreage	percent	20	53	27	100
Wheat yield (actual)	bushels/acre	38	28	7	24
Wheat yield (expected)	bushels/acre	30	25	29	27
Size:					
Total operated acreage	acres	1,348	1,399	1,535	1,421
Planted wheat acreage	acres	219	290	291	273
Sales class farms--[1]					
$0-$39,999	percent of farms	25	27	49	32
$40,000-$99,999	percent of farms	29	27	22	26
$100,000-$249,999	percent of farms	23	18	9	17
$250,000-$499,999	percent of farms	21	23	16	21
$500,000 or more	percent of farms	2	5	4	4
Wheat value of production	dollars	32,058	31,516	8,297	25,779
Farm value of production	dollars	146,517	160,475	122,802	148,946
Wheat acreage/tenure:[1]					
Percent owned	percent of farms	46	43	48	45
Percent cash-rented	percent of farms	18	18	19	18
Percent share-rented	percent of farms	36	39	32	36
Percent rent-free	percent of farms	d	d	d	d
Wheat acreage/use:					
Percent irrigated	percent of farms	97	97	94	96
Percent dryland	percent of farms	3	3	6	4
Percent with fallow	percent of farms	74	67	47	63
Percent double-cropped	percent of farms	13	11	16	13
Percent grazed	percent of farms	4	15	35	18
Previous crop on wheat acres:					
Corn	percent of farms	13	9	6	9
Sorghum	percent of farms	4	2	10	4
Soybeans	percent of farms	34	33	10	27
Wheat	percent of farms	28	37	59	40
Other	percent of farms	21	19	15	20
Financial position:					
Favorable	percent of farms	71	58	48	59
Marginal income	percent of farms	16	21	32	23
Marginal solvency	percent of farms	11	13	9	11
Vulnerable	percent of farms	2	8	11	7
Debt-to-asset	ratio	.15	.19	.16	.18
Production specialty:					
Cash grains	percent of farms	69	64	44	60
Other crops	percent of farms	5	8	8	7
Livestock	percent of farms	26	28	48	33
Operator age:					
Under 35 years	percent of farms	10	14	9	12
35-49 years	percent of farms	30	33	34	32
50-65 years	percent of farms	36	33	33	34
More than 65 years	percent of farms	24	20	24	22
Major occupation:					
Farming	percent of farms	89	89	82	87
Other	percent of farms	11	11	18	13
Fertilizer use:					
Any fertilizer	percent of farms	78	85	98	83
Nitrogen	percent of farms	73	84	98	81
Phosphorus	percent of farms	53	65	76	62
Potassium	percent of farms	35	43	54	40

d = insufficient data for disclosure.
[1] Data may not add due to rounding or omission of possible categories.

Appendix table 2--Characteristics of FCRS wheat farm operations, by enterprise size, 1989

Item	Unit	Enterprise size (acres)					All FCRS farms
		Fewer than 50	50-199	200-399	400-799	800 or more	
Share of FCRS:							
Wheat farms	percent	27	37	16	12	8	100
Wheat production	percent	2	14	16	25	43	100
Wheat acreage	percent	4	17	18	26	35	100
Wheat yield (actual)	bushels/acre	36	32	27	27	26	24
Wheat yield (expected)	bushels/acre	37	30	27	26	20	27
Size:							
Total operated acreage	acres	377	1,136	1,795	2,136	4,249	1,421
Planted wheat acreage	acres	24	102	281	550	1385	273
Sales class farms--[1]							
$0-$39,999	percent of farms	57	36	17	7	d	21
$40,000-$99,999	percent of farms	23	27	29	33	13	21
$100,000-$249,999	percent of farms	12	13	18	27	29	19
$250,000-$499,999	percent of farms	6	22	31	24	41	28
$500,000 or more	percent of farms	2	2	5	9	16	11
Wheat value of production	dollars	3,699	12,116	29,185	55,519	105,632	25,779
Farm value of production	dollars	78,970	124,425	186,610	218,184	306,568	148,946
Wheat acreage/tenure:[1]							
Percent owned	percent of farms	63	51	45	45	38	45
Percent cash-rented	percent of farms	10	16	21	19	20	19
Percent share-rented	percent of farms	24	32	34	36	41	36
Percent rent-free	percent of farms	2	d	d	d	d	d
Wheat acreage/use:							
Percent irrigated	percent of farms	3	5	4	6	3	4
Percent dryland	percent of farms	97	95	96	94	97	96
Percent with fallow	percent of farms	15	37	61	74	68	63
Percent double-cropped	percent of farms	18	20	17	15	7	13
Percent grazed	percent of farms	8	16	9	18	23	18
Previous crop on wheat acres:							
Corn	percent of farms	16	9	5	5	1	9
Sorghum	percent of farms	4	2	10	3	5	4
Soybeans	percent of farms	35	35	25	9	1	27
Wheat	percent of farms	21	37	44	65	72	40
Other	percent of farms	24	17	17	18	21	20
Financial position:							
Favorable	percent of farms	69	60	44	59	51	59
Marginal income	percent of farms	23	22	27	19	25	23
Marginal solvency	percent of farms	6	10	17	13	18	11
Vulnerable	percent of farms	2	8	12	9	6	7
Debt-to-asset	ratio	.10	.15	.22	.18	.22	.18
Production specialty:							
Cash grains	percent of farms	52	55	66	76	77	60
Other crops	percent of farms	8	8	6	5	6	7
Livestock	percent of farms	40	37	28	19	17	33
Operator age:							
Under 35 years	percent of farms	27	13	9	7	10	11
35-49 years	percent of farms	44	30	36	40	38	33
50-65 years	percent of farms	17	31	37	41	36	34
More than 65 years	percent of farms	12	26	17	12	16	22
Major occupation:							
Farming	percent of farms	72	90	93	97	96	87
Other	percent of farms	28	10	7	3	4	13
Fertilizer use:							
Any fertilizer	percent of farms	82	82	84	86	79	83
Nitrogen	percent of farms	79	81	84	82	78	81
Phosphorus	percent of farms	68	61	59	57	52	62
Potassium	percent of farms	58	41	33	24	14	40

d = insufficient data for disclosure.
[1] Data may not add due to rounding or omission of possible categories.

Appendix table 3--Characteristics of FCRS wheat farm operations, by region, 1989

Item	Unit	Region					All FCRS farms
		North-Central	Northern Plains	South-east	Central and Southern Plains	Pacific	
Share of FCRS:							
Wheat farms	percent	25	25	9	35	6	100
Wheat production	percent	7	37	5	44	7	100
Wheat acreage	percent	14	35	7	29	15	100
Wheat yield (actual)	bushels/acre	51	24	33	16	49	24
Wheat yield (expected)	bushels/acre	53	12	43	34	50	27
Size:							
Total operated acreage	acres	549	1,994	893	1,626	2,363	1421
Planted wheat acreage	acres	72	401	156	342	360	273
Sales class farms--[1]							
$0-$39,999	percent of farms	26	16	18	33	13	21
$40,000-$99,999	percent of farms	22	29	14	24	17	21
$100,000-$249,999	percent of farms	17	27	18	15	17	19
$250,000-$499,999	percent of farms	28	23	36	23	30	28
$500,000 or more	percent of farms	7	5	14	5	23	11
Wheat value of production	dollars	14,824	35,221	19,202	21,019	73,318	25,779
Farm value of production	dollars	126,938	110,352	215,478	140,362	367,418	148,946
Wheat acreage/tenure:[1]							
Percent owned	percent of farms	45	48	31	45	41	45
Percent cash-rented	percent of farms	12	25	45	13	9	19
Percent share-rented	percent of farms	43	27	24	42	50	36
Percent rent-free	percent of farms	0	2	d	d	d	d
Wheat acreage/use:							
Percent irrigated	percent of farms	1	d	1	4	23	4
Percent dryland	percent of farms	99	99	99	96	77	96
Percent with fallow	percent of farms	4	90	6	54	72	63
Percent double-cropped	percent of farms	43	2	90	11	4	13
Percent grazed	percent of farms	5	d	4	38	8	18
Previous crop on wheat acres:							
Corn	percent of farms	16	10	15	3	2	9
Sorghum	percent of farms	2	2	5	7	1	4
Soybeans	percent of farms	65	17	52	6	0	27
Wheat	percent of farms	1	41	7	76	40	40
Other	percent of farms	16	30	21	8	57	20
Financial position:							
Favorable	percent of farms	66	56	56	54	66	59
Marginal income	percent of farms	23	17	20	30	19	23
Marginal solvency	percent of farms	5	19	16	8	11	11
Vulnerable	percent of farms	6	8	8	8	4	7
Debt-to-asset	ratio	.14	.23	.15	.16	.18	.18
Production specialty:							
Cash grains	percent of farms	74	63	47	52	56	60
Other crops	percent of farms	3	1	35	4	29	7
Livestock	percent of farms	23	36	18	43	15	33
Cost groups:							
Low-cost	percent of farms	36	29	5	24	6	100
Mid-cost	percent of farms	29	28	10	26	6	100
High-cost	percent of farms	8	14	10	64	4	100
Major occupation:							
Farming	percent of farms	81	91	79	90	89	87
Other	percent of farms	19	9	21	10	11	13
Fertilizer use:							
Any fertilizer	percent of farms	96	72	93	77	87	83
Nitrogen	percent of farms	93	69	92	76	86	81
Phosphorus	percent of farms	87	63	56	47	41	62
Potassium	percent of farms	78	25	56	20	28	40

d = insufficient data for disclosure.
[1] Data may not add due to rounding or omission of possible categories.

Appendix table 4--Farm business income statement for wheat farms, by variable cost group, 1989

Item	Cost group			All FCRS farms
	Low-cost producers	Mid-cost producers	High-cost producers	
	Dollars			
Gross cash income:				
Livestock sales	147,645	165,743	140,890	155,273
Crop sales (incl. net CCC loans)	35,486	43,113	76,442	49,385
Government payments	94,461	98,919	40,951	83,693
Other farm-related income[1]	10,477	14,168	16,216	13,768
	7,222	9,543	7,281	8,426
Less:				
Cash expenses	100,754	125,842	123,908	119,260
Variable	75,806	95,882	103,341	92,812
Livestock purchases	6,174	13,285	39,792	18,019
Feed	6,226	8,513	8,478	7,947
Veterinary services and supplies	802	927	1,265	979
Other livestock-related expenses[2]	343	769	3,631	1,364
Seed and plants	6,188	7,120	3,607	6,036
Fertilizer and chemicals	19,060	23,666	11,649	19,613
Labor	10,320	10,181	9,066	9,943
Fuels and oils	6,492	7,653	6,382	7,060
Repairs and maintenance	9,728	10,985	8,900	10,170
Machine-hire and custom work	2,634	3,898	3,067	3,387
Utilities	3,414	3,813	3,554	3,652
Other variable expenses[3]	4,425	5,072	3,950	4,641
Fixed	24,948	29,960	20,567	26,448
Real estate and property taxes	2,978	2,689	2,033	2,600
Interest	10,019	12,632	9,125	11,140
Insurance premiums	3,702	4,773	3,174	4,122
Rent and lease payments	8,248	9,866	6,235	8,586
Equals: Net cash farm income	46,892	39,901	16,982	36,013
Less:				
Depreciation	15,884	15,478	9,287	14,067
Labor, noncash benefits	742	500	634	591
Plus:				
Value of inventory change	7,454	10,329	6,371	8,663
Nonmoney income[4]	2,957	2,902	2,345	2,779
Equals: Net farm income	40,677	37,153	15,777	32,797

[1] Includes income from machine-hire, custom work, livestock grazing, land rental, contract production fees, outdoor recreation, and any other farm-related source.
[2] Includes livestock leasing, custom feed processing, bedding, and grazing.
[3] Includes supplies, registration fees, transportation, storage, and general business expenses.
[4] Defined as the value of home consumption and imputed rental value of farm dwellings.
Source: 1989 Farm Costs and Returns Survey.

Appendix table 5--Farm operation balance sheet for wheat farms, by variable cost group, 1989

Item	Cost group			All FCRS farms
	Low-cost producers	Mid-cost producers	High-cost producers	
			Dollars	
Total assets	637,851	660,826	526,638	622,496
Current assets	93,336	111,772	90,906	102,191
Livestock inventory	14,830	18,647	24,243	19,083
Crop inventory	35,200	36,854	11,636	30,299
Purchased inputs	3,184	4,276	2,085	3,476
Prepaid insurance	926	1,193	794	1,031
Other assets[1]	39,196	50,801	52,148	48,303
Noncurrent assets	544,515	549,054	435,733	520,305
Investments	4,136	3,456	1,690	3,191
Land and buildings[2]	403,229	406,083	329,667	386,747
Operator's dwelling	35,821	37,614	29,214	35,128
Farm equipment	110,445	115,367	75,213	104,373
Breeding animals	26,705	24,148	29,163	25,994
Total debt	95,788	127,249	84,051	109,048
Current liabilities	32,369	37,841	30,640	34,751
Notes payable within 1 year	14,861	14,311	15,653	14,772
Current portion of term debt	10,127	15,204	9,328	12,534
Accrued interest	2,652	3,568	2,352	3,048
Accounts payable	4,729	4,758	3,307	4,397
Noncurrent liabilities	63,419	89,408	53,411	74,297
Nonreal estate	20,200	32,287	20,299	26,418
Real estate	43,220	57,121	33,112	47,878
Average debt by lender:				
Farmers Home Administration	10,117	18,346	20,583	16,887
Farm Credit System	25,568	34,966	18,354	28,625
Commercial banks	34,452	41,004	29,977	36,718
Other	18,271	24,606	9,478	19,373
Commodity Credit Corporation crop loans[3]	2,884	6,240	2,005	4,390
Equity	542,063	533,577	442,588	513,448
			Ratio	
Current ratio	2.88	2.95	2.97	2.94
Debt/asset ratio	0.15	0.19	0.16	0.18

[1] Includes accounts receivable, certificates of deposit, checking and savings balances, and any other financial assets of the farm business.

[2] The value of the operator's dwelling and any associated liabilities were included if the dwelling was located on the farm.

[3] Commodity Credit Corporation crop loans were excluded from both assets and liabilities.

Source: 1989 Farm Costs and Returns Survey.

Appendix table 6--Farm business income statement for wheat farms, by enterprise size, 1989

Item	Enterprise size (acres)					All FCRS farms
	Fewer than 50	50-199	200-399	400-799	800 or more	
	Dollars					
Gross cash income:	61,513	125,172	185,341	225,424	334,749	155,273
Livestock sales	22,849	48,479	41,287	62,175	109,839	49,385
Crop sales (incl. net CCC loans)	28,749	60,799	116,796	133,218	171,402	83,693
Government payments	4,033	9,479	17,255	21,402	35,170	13,768
Other farm-related income[1]	5,882	6,416	10,004	8,629	18,337	8,426
Less:						
Cash expenses	44,660	93,327	139,939	168,934	281,674	119,260
Variable	34,426	72,913	106,749	132,433	220,987	92,812
Livestock purchases	3,168	10,047	7,345	29,049	80,040	18,019
Feed	4,339	10,433	9,281	6,555	8,298	7,947
Veterinary services and supplies	532	1,188	794	856	1,799	979
Other livestock-related expenses[2]	261	506	891	6,104	1,039	1,364
Seed and plants	2,372	4,787	8,631	7,630	12,720	6,036
Fertilizer and chemicals	8,044	15,374	26,425	27,886	39,349	19,613
Labor	3,023	7,036	15,832	14,283	21,062	9,943
Fuels and oils	2,843	5,479	9,107	10,198	14,856	7,060
Repairs and maintenance	4,833	8,427	13,004	14,116	18,871	10,170
Machine-hire and custom work	1,080	2,472	4,016	4,288	9,654	3,387
Utilities	1,868	3,224	5,670	4,704	4,822	3,652
Other variable expenses[3]	2,064	3,939	5,753	6,764	8,476	4,641
Fixed	10,233	20,415	33,190	36,500	60,688	26,448
Real estate and property taxes	1,651	2,155	2,831	3,446	4,793	2,600
Interest	3,770	7,904	14,354	16,233	27,374	11,140
Insurance premiums	1,660	2,803	4,999	5,834	10,599	4,122
Rent and lease payments	3,152	7,553	11,006	10,987	17,921	8,586
Equals: Net cash farm income	16,853	31,845	45,402	56,491	53,075	36,013
Less:						
Depreciation	7,079	11,743	16,743	19,336	26,996	14,067
Labor, noncash benefits	167	461	548	1,332	1,080	591
Plus:						
Value of inventory change	5,053	9,003	7,164	7,750	19,571	8,663
Nonmoney income[4]	2,873	2,693	2,825	2,645	2,951	2,779
Equals: Net farm income	17,533	31,337	38,099	46,216	47,521	32,797

[1] Includes income from machine-hire, custom work, livestock grazing, land rental, contract production fees, outdoor recreation, and any other farm-related source.

[2] Includes livestock leasing, custom feed processing, bedding, and grazing.

[3] Includes supplies, registration fees, transportation, storage, and general business expenses.

[4] Defined as the value of home consumption and imputed rental value of farm dwellings.

Source: 1989 Farm Costs and Returns Survey.

Appendix table 7--Farm operation balance sheet for wheat farms, by enterprise size, 1989

Item	Enterprise size (acres)					All FCRS farms
	Fewer than 50	50-199	200-399	400-799	800 or more	
			Dollars			
Total assets	376,471	520,272	691,062	838,268	1,141,468	622,496
Current assets	61,017	100,716	106,094	131,603	158,642	102,191
Livestock inventory	9,044	17,010	16,089	33,366	34,674	19,083
Crop inventory	14,577	23,473	37,672	43,979	60,096	30,299
Purchased inputs	1,408	3,444	4,314	3,880	6,666	3,476
Prepaid insurance	415	701	1,250	1,459	2,650	1,031
Other assets[1]	35,572	56,088	46,769	48,920	54,556	48,303
Noncurrent assets	315,454	419,557	584,968	706,665	982,826	520,305
Investments	783	2,098	3,510	2,599	12,762	3,191
Land and buildings[2]	249,569	303,304	441,736	531,374	704,056	386,747
Operator's dwelling	36,552	35,202	32,979	32,805	37,881	35,128
Farm equipment	51,736	84,756	111,672	146,223	224,941	104,373
Breeding animals	13,366	29,399	28,051	26,469	41,067	25,994
Total debt	38,414	77,121	152,719	153,384	254,441	109,048
Current liabilities	11,245	24,101	47,117	54,777	79,319	34,751
Notes payable within 1 year	3,633	9,143	18,455	28,802	34,885	14,772
Current portion of term debt	4,423	9,029	19,046	15,929	28,767	12,534
Accrued interest	1,057	2,136	4,293	4,300	7,163	3,048
Accounts payable	2,132	3,793	5,323	5,746	8,503	4,397
Noncurrent liabilities	27,169	53,021	105,603	98,608	175,122	74,297
Nonreal estate	9,002	19,199	42,609	32,158	59,077	26,418
Real estate	18,167	33,822	62,993	66,450	116,044	47,878
Average debt by lender:						
Farmers Home Administration	3,494	17,523	32,258	20,862	18,127	16,887
Farm Credit System	12,667	16,074	32,659	41,169	84,109	28,625
Commercial banks	12,165	23,658	54,556	53,266	88,124	36,718
Other	6,899	13,938	23,630	28,042	48,413	19,373
Commodity Credit Corporation crop loans[3]	753	2,061	7,110	7,868	11,774	4,390
Equity	338,057	443,151	538,343	684,883	887,027	513,448
			Ratio			
Current ratio	5.43	4.18	2.25	2.40	2.00	2.94
Debt/asset ratio	0.10	0.15	0.22	0.18	0.22	0.18

[1] Includes accounts receivable, certificates of deposit, checking and savings balances, and any other financial assets of the farm business.

[2] The value of the operator's dwelling and any associated liabilities were included if the dwelling was located on the farm.

[3] Commodity Credit Corporation crop loans were excluded from both assets and liabilities.

Source: 1989 Farm Costs and Returns Survey.

Appendix table 8--Farm business income statement for wheat farms, by region, 1989

Item	Region					All FCRS farms
	North-Central	Northern Plains	South-east	Central and Southern Plains	Pacific	
			Dollars			
Gross cash income	112,515	119,390	210,564	144,938	344,187	155,273
Livestock sales	35,341	35,583	24,666	81,644	40,060	49,385
Crop sales (incl. net CCC loans)	63,294	57,906	154,511	42,814	276,610	83,693
Government payments	6,861	16,566	18,522	14,279	15,364	13,768
Other farm-related income[1]	7,019	9,335	12,865	6,202	12,153	8,426
Less:						
Cash expenses	85,201	92,379	159,676	121,770	232,517	119,260
Variable	66,634	61,372	126,216	101,809	186,430	92,812
Livestock purchases	7,029	6,017	2,737	42,399	13,315	18,019
Feed	9,036	5,554	9,432	9,588	5,711	7,947
Veterinary services and supplies	958	732	499	1,330	1,059	979
Other livestock-related expense[2]	223	539	138	3,209	1,544	1,364
Seed and plants	5,725	5,956	9,797	3,511	11,799	6,036
Fertilizer and chemicals	19,022	14,326	42,520	10,831	44,138	19,613
Labor	5,319	4,507	20,951	5,670	40,698	9,943
Fuels and oils	4,957	6,541	9,946	6,728	11,889	7,060
Repairs and maintenance	8,206	8,393	15,655	8,860	19,207	10,170
Machine-hire and custom work	1,483	2,592	4,698	3,420	8,863	3,387
Utilities	1,797	2,326	3,738	2,530	15,588	3,652
Other variable expenses[3]	2,880	3,891	6,103	3,733	12,619	4,641
Fixed	18,567	31,006	33,459	19,961	46,087	26,448
Real estate and property taxes	2,163	2,800	2,380	2,334	4,111	2,600
Interest	7,001	12,498	11,645	10,162	19,519	11,140
Insurance premiums	2,220	5,258	5,865	3,039	7,112	4,122
Rent and lease payments	7,184	10,450	13,570	4,427	15,345	8,586
Equals: Net cash farm income	27,313	27,011	50,888	23,168	111,670	36,013
Less:						
Depreciation	12,304	15,655	16,977	10,748	21,673	14,067
Labor, noncash benefits	142	512	1,107	386	2,072	591
Plus:						
Value of inventory change	10,485	13,057	6,121	1,464	17,534	8,663
Nonmoney income[4]	3,304	2,385	3,194	2,454	3,413	2,779
Equals: Net farm income	28,656	26,287	42,119	15,952	108,872	32,797

[1] Includes income from machine-hire, custom work, livestock grazing, land rental, contract production fees, outdoor recreation, and any other farm-related source.

[2] Includes livestock leasing, custom feed processing, bedding, and grazing.

[3] Includes supplies, registration fees, transportation, storage, and general business expenses.

[4] Defined as the value of home consumption and imputed rental value of farm dwellings.

Source: 1989 Farm Costs and Returns Survey.

Appendix table 9--Characteristics of FCRS wheat farm operations, by region, 1989

Item	Region					All FCRS farms
	North-Central	Northern Plains	South-east	Central and Southern Plains	Pacific	
			Dollars			
Total assets	563,069	612,536	706,703	557,320	927,158	622,496
Current assets	93,966	100,029	77,843	102,098	151,290	102,191
Livestock inventory	14,615	11,986	9,624	31,631	18,140	19,083
Crop inventory	34,390	39,663	19,404	15,093	53,467	30,299
Purchased inputs	4,389	4,483	3,416	1,709	4,238	3,476
Prepaid insurance	555	1,315	1,466	760	1,778	1,031
Other assets[1]	40,017	42,582	43,932	52,905	73,666	48,303
Noncurrent assets	469,103	512,508	628,860	455,221	775,868	520,305
Investments	979	3,849	1,963	2,546	9,700	3,191
Land and buildings[2]	354,932	364,969	494,220	334,629	596,832	386,747
Operator's dwelling	42,953	25,443	43,458	32,480	46,631	35,128
Farm equipment	97,882	108,474	119,389	87,952	147,439	104,373
Breeding animals	15,310	35,216	13,288	30,095	21,898	25,994
Total debt	76,349	138,301	107,568	88,591	167,275	109,048
Current liabilities	25,309	37,843	29,276	33,311	57,555	34,751
Notes payable within 1 year	11,153	13,141	5,507	17,371	28,293	14,772
Current portion of term debt	8,404	15,711	15,728	10,227	17,314	12,534
Accrued interest	2,118	3,879	2,986	2,486	4,660	3,048
Accounts payable	3,635	5,112	5,055	3,228	7,288	4,397
Noncurrent liabilities	51,040	100,458	78,292	55,279	109,720	74,297
Nonreal estate	17,298	30,633	38,205	23,361	34,096	26,418
Real estate	33,742	69,825	40,087	31,919	75,623	47,878
Average debt by lender:						
Farmers Home Administration	5,956	30,266	27,512	10,175	14,635	16,887
Farm Credit System	19,931	36,369	29,516	21,912	47,205	28,625
Commercial banks	30,773	37,786	24,501	36,154	60,886	36,718
Other	13,936	24,889	17,998	14,636	32,601	19,373
Commodity Credit Corporation crop loans[3]	2,416	7,410	8,404	1,816	4,698	4,390
Equity	486,720	474,235	599,135	468,729	759,883	513,448
			Ratio			
Current ratio	3.71	2.64	2.66	3.06	2.63	2.94
Debt/asset ratio	0.14	0.23	0.15	0.16	0.18	0.18

[1] Includes accounts receivable, certificates of deposit, checking and savings balances, and any other financial assets of the farm business.

[2] The value of the operator's dwelling and any associated liabilities were included if the dwelling was located on the farm.

[3] Commodity Credit Corporation crop loans were excluded from both assets and liabilities.

Source: 1989 Farm Costs and Returns Survey.

Appendix 2: About the Accounting System

Three characteristics distinguish ERS's estimates from other cost accounting systems: the exclusion of the direct effects of Government programs on costs and returns, combination of farm operation and landlord costs and returns, and separation of production and marketing costs.

The costs and returns presented in this report are the same as those previously published in the *Economic Indicators of the Farm Sector* series published by USDA's Economic Research Service (ERS). The methods and format used by ERS have been developed over time with input from the National Agricultural Cost of Production Standards Review Board, which was established under the Agricultural and Food Act of 1981. This format was revised in the early 1980's after reviews by commodity groups, land-grant university economists, and individual farmers (USDA, ERS, 1991; USDA, ERS, 1992a; Morehart, 1992).

A relatively new system to estimate commodity costs and returns, called the Farm-Level Budget Model (FLBM), was implemented for rice in 1988 (Glaze, 1988). The FLBM replaces a version of the Firm Enterprise Data System (FEDS) previously used to estimate costs and returns. Under the FLBM, costs and returns were calculated for each FCRS farm observation, then farms were weighted to provide State, regional, and national estimates. Under the FEDS, cost and returns estimates were calculated as if all production of a commodity were produced on a single acre in the State. Estimates generated with the FLBM allow for the distributional analysis presented in this report.

There are three underlying characteristics of the ERS estimates of crop costs and returns that distinguish them from other cost accounting systems:

Government programs. ERS estimates exclude the direct effects of Government programs when possible. However, Government commodity programs indirectly affect ERS cost-of-production accounts through crop and input prices. The market prices used by ERS often are influenced by Government nonrecourse and marketing loan programs. Since ERS allocates some whole-farm fixed expenses and calculates share-rental costs and residual returns to management and risk from crop prices, there is an indirect effect. Participants in an income-support program must set aside or conserve a portion of their acreage that would have been planted to a particular crop. In return, participants receive direct Government payments based on production of the crop on the remaining acreage. Participants may be required to incur costs by maintaining a cover crop or controlling weeds on the set-aside acreage. ERS does not include the costs of participating in the Government commodity-based income-support programs. The exclusion of the direct effects of Government programs provides information to policymakers and analysts about production costs and returns in the absence of Government programs. For a further discussion of the effects of Government programs on commodity costs and returns, see Salassi, 1990.

Combined operation-landlord costs and returns. Since the estimates represent the agricultural sector, costs and returns for the farm operator and landlord are combined, as if they were one business. Thus, each line item is for the farm operation and the landlord. The combined operation-landlord account means that estimates for cash expenses do not include cash- and share-rent expenses paid by the farm operation to the landlord. A rental expense to the farm business is exactly offset as an income to the landlord. An opportunity cost for the use of land is charged under economic costs.

Separation of production and marketing costs. Costs incurred up to the first point of sale, or storage if the commodity is not sold immediately after harvest, are defined as production costs. Costs of drying and hauling the crop to the elevator or a processor are also considered production costs. Because storage costs are excluded, the commodity is valued at the time of harvest.

Appendix 3: Data Reliability

Survey results are only indications of the total population. They may differ from data collected in a complete census using the same questionnaires, instructions, and enumerators. A measure of this sample variability, called sampling error, is available from survey results. Sampling error may be expressed as a percentage of the estimate. These percentages represent the relative standard error of the estimate and are often referred to as coefficients of variation (C.V.). In general, the smaller the C.V., the greater the reliability of the estimate.

The average total variable cash expenses of production for all farms, $53 per acre, has a C.V. of 3 percent (appendix table 10). Therefore, the confidence interval for total variable cash expenses per acre of producing wheat in the United States is estimated to be between $49.88 and $56.12 per acre based on a 95-percent probability. The relative standard error of an estimate can also be used to evaluate the statistical significance of differences between groups. For example, the appropriate t-statistic for a comparison of total variable cash expenses per acre between low- and high-cost farms would be constructed by taking the difference between the mean of the two groups (TVC) and dividing by the square root of the sum of the squared standard errors (SE^2) of the two groups. This is estimated as follows:

$$t = \frac{(TVC_{low\text{-}cost} - TVC_{high\text{-}cost})}{(SE^2_{low\text{-}cost} + SE^2_{high\text{-}cost})^{0.5}}$$

$$= (41.26 - 50.85) / (2.576 + 9.748)^{0.5}$$

$$= -2.732$$

Survey data are also influenced by nonsampling errors, which are not measurable or known. Nonsampling errors may be introduced by enumerators, respondents, and questionnaire design, among other factors. Efforts were made to minimize these errors and maintain survey accuracy, including training of data collectors, detailed review and edit of data, and analysis for comparability and consistency.

Appendix table 10--Coefficients of variation of wheat variable cash expenses, by variable cash expense group, 1989

Item	Cost group			All FCRS farms
	Low-cost producers	Mid-cost producers	High-cost producers	
	Percent			
Costs per bushel:				
Variable cash expenses-actual yield	2.01	1.42	8.22	2.78
Costs and returns per acre:				
Value of production[1]	4.20	2.44	16.74	4.58
Total variable cash expenses	3.69	2.23	9.69	3.00
Seed	3.78	3.12	7.94	3.01
Fertilizer	9.24	3.94	17.53	5.27
Chemicals	11.12	5.86	8.37	4.35
Custom operations	16.58	8.90	12.26	6.68
Fuel, lube, and electricity	5.06	3.21	8.72	3.15
Repairs	4.45	2.13	7.43	2.43
Hired labor	23.00	8.40	17.93	7.58
Purchased irrigation water	35.66	25.37	49.75	21.23
Technical services	50.38	27.18	42.58	21.56
Returns above variable cash expenses	4.71	3.52	7.26	7.63

[1] Value of production is estimated using yields reported in the FCRS and State-level wheat harvest-month prices published by NASS.

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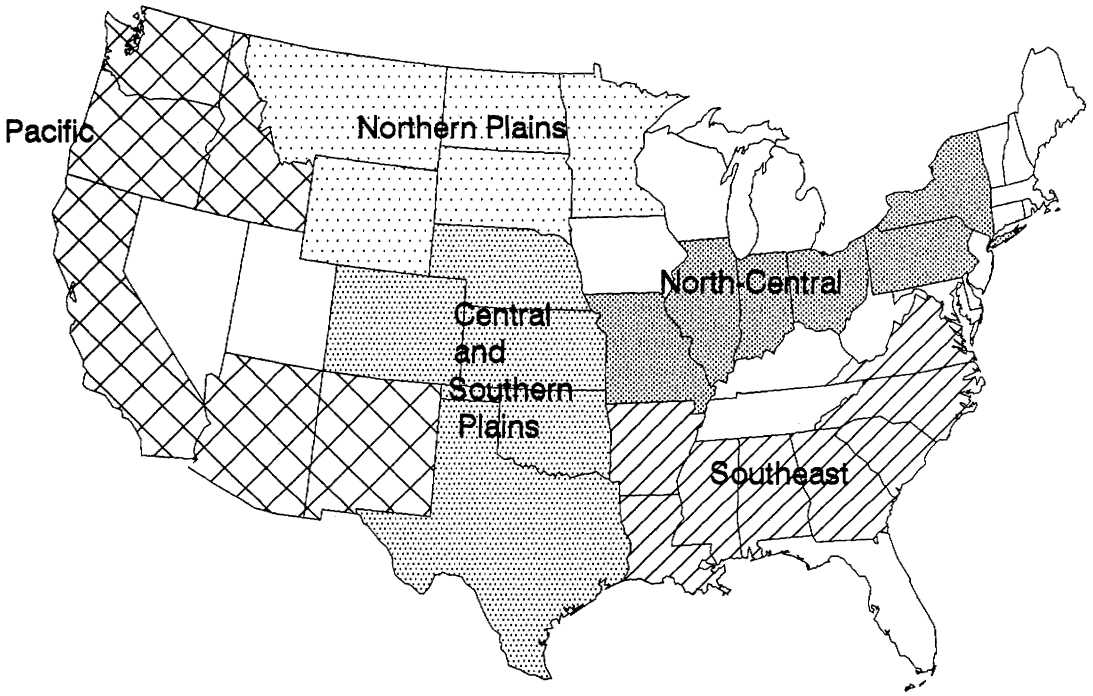

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