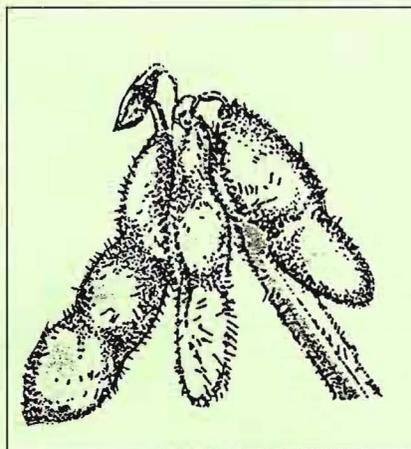


ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS

EXTENSION TECHNICAL BULLETIN NO. 76

SOYBEANS

LOAMY SOILS



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ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

Lanny O. Ashlock, Chairman
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THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$9.60	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$15.03	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$9.49	
REPAIRS	\$18.96	
LABOR	\$7.67	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$0.00	
REPAIRS	\$0.00	
IRRIGATION LABOR	\$0.00	
CUSTOM SPREAD	\$2.50	
CUSTOM HAUL	\$3.75	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$4.73	

TOTAL SPECIFIED OPERATING COSTS \$90.64

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST YIELD IN BUSHELS

YIELD	16.25	18.75	25.00	31.25	33.75
PER UNIT BREAKEVEN PRICE	\$5.49	\$4.78	\$3.63	\$2.93	\$2.73

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$7.38	
INTEREST	\$6.09	
EQUIPMENT:		
DEPRECIATION	\$6.71	
INTEREST	\$3.68	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
TAXES & INSURANCE	\$3.13	
INTEREST	\$0.34	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$42.33

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$132.98

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST YIELD IN BUSHELS

YIELD	16.25	18.75	25.00	31.25	33.75
PER UNIT BREAKEVEN PRICE	\$8.10	\$7.04	\$5.32	\$4.29	\$3.98

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9001
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: NONE

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$20.06	\$25.07	\$30.09
REPAIRS	\$15.17	\$18.96	\$22.75
HERBICIDE	\$12.02	\$15.03	\$18.04
OWNERSHIP INTEREST	\$11.30	\$14.13	\$16.95
FERTILIZER	\$7.68	\$9.60	\$11.52
SEED	\$7.63	\$9.54	\$11.45
MACHINERY FUEL & OIL	\$7.59	\$9.49	\$11.39
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
HIRED LABOR	\$6.14	\$7.67	\$9.21
INTEREST ON OP. CAP.	\$3.78	\$4.73	\$5.67
HAUL (CUSTOM HIRE)	\$3.00	\$3.75	\$4.50
FARM TAXES	\$2.00	\$2.51	\$3.01
SPREAD (CUSTOM HIRE)	\$2.00	\$2.50	\$3.00
FUNGICIDE	\$1.17	\$1.46	\$1.76
FARM INSURANCE	\$0.50	\$0.63	\$0.75
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
IRRIGATION FUEL & OIL			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE	\$106.38	\$132.98	\$159.57
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PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS		BREAKEVEN PRICE	
	YIELD		
-35% OF BASE YIELD	16.25	\$6.48	\$8.10
-25% OF BASE YIELD	18.75	\$5.63	\$7.04
BASE YIELD	25.00	\$4.26	\$5.32
+25% OF BASE YIELD	31.25	\$3.43	\$4.29
+35% OF BASE YIELD	33.75	\$3.18	\$3.98

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9001
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: NONE

- 20% DEVIATION FROM BASE COSTS: \$106.38 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	16.25	18.75	25.00	31.25	33.75	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$44.54)	(\$35.51)	(\$12.94)	\$9.63	\$18.65
	\$4.74	(\$28.19)	(\$16.64)	\$12.21	\$41.07	\$52.61
BASE PRICE =	\$5.75	(\$11.84)	\$2.22	\$37.37	\$72.52	\$86.57
	\$6.76	\$4.52	\$21.09	\$62.53	\$103.96	\$120.54
	\$7.76	\$20.87	\$39.96	\$87.68	\$135.41	\$154.50

BASE COSTS: \$132.98 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	16.25	18.75	25.00	31.25	33.75	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$70.86)	(\$61.91)	(\$39.54)	(\$17.17)	(\$8.22)
	\$4.74	(\$54.50)	(\$43.04)	(\$14.38)	\$14.28	\$25.74
BASE PRICE =	\$5.75	(\$38.15)	(\$24.17)	\$10.77	\$45.72	\$59.70
	\$6.76	(\$21.80)	(\$5.31)	\$35.93	\$77.17	\$93.66
	\$7.76	(\$5.45)	\$13.56	\$61.09	\$108.61	\$127.62

+ 20% DEVIATION FROM BASE COSTS: \$159.57 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	16.25	18.75	25.00	31.25	33.75	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$97.17)	(\$88.31)	(\$66.13)	(\$43.96)	(\$35.09)
	\$4.74	(\$80.82)	(\$69.44)	(\$40.98)	(\$12.52)	(\$1.13)
BASE PRICE =	\$5.75	(\$64.47)	(\$50.57)	(\$15.82)	\$18.93	\$32.83
	\$6.76	(\$48.12)	(\$31.70)	\$9.34	\$50.38	\$66.79
	\$7.76	(\$31.77)	(\$12.84)	\$34.49	\$81.82	\$100.75

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

INFORMATION PRESENTED IN THIS DOCUMENT IS PREPARED SOLELY AS A GENERAL GUIDE AND IS NOT INTENDED TO RECOGNIZE OR PREDICT THE COSTS AND RETURNS FROM ANY ONE PARTICULAR FARM OR RANCH OPERATION

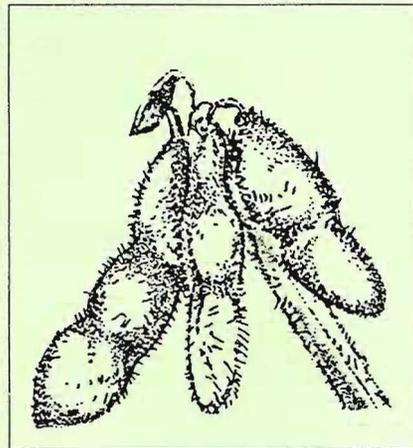
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ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS

EXTENSION TECHNICAL BULLETIN NO. 77

SOYBEANS

LOAMY SOILS, FURROW IRRIGATION



AUTHORS

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The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

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SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$14.00	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$15.03	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$10.69	
REPAIRS	\$20.82	
LABOR	\$8.65	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.64	
REPAIRS	\$2.46	
IRRIGATION LABOR	\$8.96	
CUSTOM SPREAD	\$2.50	
CUSTOM HAUL	\$6.00	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$6.42	

TOTAL SPECIFIED OPERATING COSTS \$123.07

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHELS

	26.00	30.00	40.00	50.00	54.00
	\$4.65	\$4.05	\$3.08	\$2.49	\$2.32

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$8.49	
INTEREST	\$7.01	
EQUIPMENT:		
DEPRECIATION	\$7.30	
INTEREST	\$4.00	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$10.82	
INTEREST	\$9.52	
TAXES & INSURANCE	\$5.58	
INTEREST	\$0.61	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$68.31

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$191.38

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHELS

	26.00	30.00	40.00	50.00	54.00
	\$7.28	\$6.33	\$4.78	\$3.86	\$3.59

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9002
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FURROW

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$30.07	\$37.58	\$45.10
OWNERSHIP INTEREST	\$20.12	\$25.15	\$30.18
REPAIRS	\$18.62	\$23.27	\$27.93
HIRED LABOR	\$14.09	\$17.62	\$21.14
HERBICIDE	\$12.02	\$15.03	\$18.04
FERTILIZER	\$11.20	\$14.00	\$16.80
MACHINERY FUEL & OIL	\$8.55	\$10.69	\$12.83
SEED	\$7.63	\$9.54	\$11.45
IRRIGATION FUEL & OIL	\$6.91	\$8.64	\$10.36
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
INTEREST ON OP. CAP.	\$5.13	\$6.42	\$7.70
HAUL (CUSTOM HIRE)	\$4.80	\$6.00	\$7.20
FARM TAXES	\$3.57	\$4.46	\$5.35
SPREAD (CUSTOM HIRE)	\$2.00	\$2.50	\$3.00
FUNGICIDE	\$1.17	\$1.46	\$1.76
FARM INSURANCE	\$0.89	\$1.12	\$1.34
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$153.11 \$191.38 \$229.66

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE		
-35% OF BASE YIELD	26.00	\$5.82	\$7.28	\$8.73
-25% OF BASE YIELD	30.00	\$5.06	\$6.33	\$7.59
BASE YIELD	40.00	\$3.83	\$4.78	\$5.74
+25% OF BASE YIELD	50.00	\$3.09	\$3.86	\$4.63
+35% OF BASE YIELD	54.00	\$2.87	\$3.59	\$4.30

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9002
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FURROW

- 20% DEVIATION FROM BASE COSTS: \$153.11 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - -RETURNS PER ACRE- - - - -					
	\$3.74	(\$54.16)	(\$39.72)	(\$3.61)	\$32.50	\$46.95
	\$4.74	(\$28.00)	(\$9.53)	\$36.64	\$82.82	\$101.28
BASE PRICE =	\$5.75	(\$1.83)	\$20.66	\$76.89	\$133.13	\$155.62
	\$6.76	\$24.33	\$50.85	\$117.14	\$183.44	\$209.96
	\$7.76	\$50.49	\$81.03	\$157.39	\$233.75	\$264.30

BASE COSTS: \$191.38 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - -RETURNS PER ACRE- - - - -					
	\$3.74	(\$91.99)	(\$77.68)	(\$41.88)	(\$6.09)	\$8.23
	\$4.74	(\$65.83)	(\$47.49)	(\$1.63)	\$44.22	\$62.56
BASE PRICE =	\$5.75	(\$39.67)	(\$17.30)	\$38.62	\$94.53	\$116.90
	\$6.76	(\$13.50)	\$12.89	\$78.87	\$144.85	\$171.24
	\$7.76	\$12.66	\$43.07	\$119.12	\$195.16	\$225.58

+ 20% DEVIATION FROM BASE COSTS: \$229.66 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - -RETURNS PER ACRE- - - - -					
	\$3.74	(\$129.83)	(\$115.64)	(\$80.16)	(\$44.68)	(\$30.49)
	\$4.74	(\$103.66)	(\$85.45)	(\$39.91)	\$5.63	\$23.84
BASE PRICE =	\$5.75	(\$77.50)	(\$55.26)	\$0.34	\$55.94	\$78.18
	\$6.76	(\$51.34)	(\$25.07)	\$40.59	\$106.25	\$132.52
	\$7.76	(\$25.18)	\$5.11	\$80.84	\$156.57	\$186.86

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

INFORMATION PRESENTED IN THIS DOCUMENT IS PREPARED SOLELY AS A GENERAL GUIDE AND IS NOT INTENDED TO RECOGNIZE OR PREDICT THE COSTS AND RETURNS FROM ANY ONE PARTICULAR FARM OR RANCH OPERATION

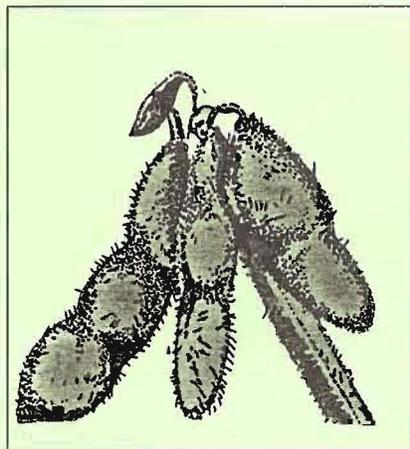
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**ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS**

EXTENSION TECHNICAL BULLETIN NO. 78

SOYBEANS

**IN RICE ROTATION,
LOAMY SOILS, FLOOD IRRIGATION**



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**UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION**

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

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THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$22.46	
LINE + APPLICATION	\$0.00	
HERBICIDE	\$21.57	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$12.87	
REPAIRS	\$23.45	
LABOR	\$10.32	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.00	
REPAIRS	\$2.86	
IRRIGATION LABOR	\$5.98	
CUSTOM SPREAD	\$2.50	
CUSTOM HAUL	\$6.00	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$1.25	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$7.05	

TOTAL SPECIFIED OPERATING COSTS \$135.31

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST					
YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00
	\$5.12	\$4.46	\$3.38	\$2.74	\$2.55

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$10.67	
INTEREST	\$8.80	
EQUIPMENT:		
DEPRECIATION	\$8.09	
INTEREST	\$4.61	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$8.16	
INTEREST	\$7.62	
TAXES & INSURANCE	\$5.69	
INTEREST	\$0.63	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$69.28

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$204.59

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST					
YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00
	\$7.78	\$6.77	\$5.11	\$4.12	\$3.83

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, IN RICE ROTATION, 1990
 ENTERPRISE FILE NO.: SOY9003
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$30.32	\$37.91	\$45.49
REPAIRS	\$21.05	\$26.31	\$31.57
OWNERSHIP INTEREST	\$20.55	\$25.68	\$30.82
FERTILIZER	\$17.97	\$22.46	\$26.95
HERBICIDE	\$17.25	\$21.57	\$25.88
HIRED LABOR	\$13.03	\$16.29	\$19.55
MACHINERY FUEL & OIL	\$10.30	\$12.87	\$15.45
SEED	\$7.63	\$9.54	\$11.45
IRRIGATION FUEL & OIL	\$6.40	\$8.00	\$9.60
INTEREST ON OP. CAP.	\$5.64	\$7.05	\$8.46
HAUL (CUSTOM HIRE)	\$4.80	\$6.00	\$7.20
FARM TAXES	\$3.64	\$4.56	\$5.47
SPREAD (CUSTOM HIRE)	\$2.00	\$2.50	\$3.00
FUNGICIDE	\$1.17	\$1.46	\$1.76
MISCELLANEOUS	\$1.00	\$1.25	\$1.50
FARM INSURANCE	\$0.91	\$1.14	\$1.37
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
LIME + APPLICATION			
MACHINE HIRE			
MANAGEMENT			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE	\$163.67	\$204.59	\$245.51
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PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS			
	YIELD	BREAKEVEN PRICE	
-35% OF BASE YIELD	26.00	\$6.23	\$9.34
-25% OF BASE YIELD	30.00	\$5.41	\$8.12
BASE YIELD	40.00	\$4.09	\$6.14
+25% OF BASE YIELD	50.00	\$3.30	\$4.95
+35% OF BASE YIELD	54.00	\$3.06	\$4.60

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, IN RICE ROTATION, 1990
 ENTERPRISE FILE NO.: SOY9003
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

- 20% DEVIATION FROM BASE COSTS: \$163.67 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$64.72)	(\$50.28)	(\$14.17)	\$21.94	\$36.38
	\$4.74	(\$38.56)	(\$20.09)	\$26.08	\$72.25	\$90.72
BASE PRICE =	\$5.75	(\$12.40)	\$10.10	\$66.33	\$122.56	\$145.06
	\$6.76	\$13.76	\$40.28	\$106.58	\$172.88	\$199.40
	\$7.76	\$39.93	\$70.47	\$146.83	\$223.19	\$253.73

BASE COSTS: \$204.59 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$105.20)	(\$90.88)	(\$55.09)	(\$19.30)	(\$4.98)
	\$4.74	(\$79.03)	(\$60.69)	(\$14.84)	\$31.02	\$49.36
BASE PRICE =	\$5.75	(\$52.87)	(\$30.51)	\$25.41	\$81.33	\$103.70
	\$6.76	(\$26.71)	(\$0.32)	\$65.66	\$131.64	\$158.03
	\$7.76	(\$0.55)	\$29.87	\$105.91	\$181.95	\$212.37

+ 20% DEVIATION FROM BASE COSTS: \$245.51 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$145.67)	(\$131.48)	(\$96.01)	(\$60.53)	(\$46.34)
	\$4.74	(\$119.51)	(\$101.29)	(\$55.76)	(\$10.22)	\$8.00
BASE PRICE =	\$5.75	(\$93.35)	(\$71.11)	(\$15.51)	\$40.10	\$62.34
	\$6.76	(\$67.18)	(\$40.92)	\$24.74	\$90.41	\$116.67
	\$7.76	(\$41.02)	(\$10.73)	\$64.99	\$140.72	\$171.01

SEQUENCE OF OPERATIONS

ENTERPRISE: SOYBEANS, IN RICE ROTATION, 1990
 ENTERPRISE FILE NO.: SOY9003
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

MACHINERY COST

OPER- ATION NO. (A)	DATE (B)	OPERATION (C)	WIDTH (FEET) (D)	HORSE POWER PTO (E)	PERFORMANCE RATE (AC/HR) (F)	TIMES OVER (NO.) (G)	OPERATING COST			OWNERSHIP COST		TOTAL COST (M)
							REPAIRS & MAINTENANCE (H)	FUEL, OIL & LUB (I)	DEPRE- CIATION (J)	INTEREST (K)	TAXES & INSURANCE (L)	
1	11	DISK, MC 9.0" SPACING	26.7	175.0	11.638	1.000	\$1.16	\$0.66	\$1.34	\$0.97	\$0.22	\$4.34
2	4	DISK, MC 9.0" SPACING	26.7	175.0	11.638	1.000	\$1.16	\$0.66	\$1.34	\$0.97	\$0.22	\$4.34
3	4	FIELD CULTIVATOR	25.5	175.0	9.891	1.000	\$1.26	\$0.77	\$1.31	\$0.99	\$0.23	\$4.56
4	4	LAND FLOAT	16.0	175.0	7.273	1.000	\$1.45	\$1.05	\$1.27	\$1.15	\$0.26	\$5.17
5	5	APPLY FERTILIZER	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	5		0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	5		0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
6	5	FIELD CULTIVATOR	25.5	175.0	9.891	1.000	\$1.26	\$0.77	\$1.31	\$0.99	\$0.23	\$4.56
7	5	TRIPLE - K	26.7	175.0	11.638	1.000	\$1.25	\$0.66	\$1.28	\$1.00	\$0.23	\$4.40
	5	SPRAYER, SADDLE MTD BC	26.7	0.0	11.638	1.000	\$0.13	\$0.00	\$0.31	\$0.17	\$0.04	\$0.64
	5	PICKUP, WATER TANK	20.0	170.0	8.485	0.120	\$0.11	\$0.10	\$0.06	\$0.02	\$0.00	\$0.29
8	5	PLANTER 8 ROW @ 30"	20.0	140.0	7.309	1.000	\$2.02	\$0.83	\$2.21	\$1.11	\$0.25	\$6.43
	5		0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
9	5	LEVEE SURVEY	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
10	5	DITCHER, REAR MTD POWER	3.0	140.0	0.436	0.010	\$0.15	\$0.14	\$0.29	\$0.20	\$0.04	\$0.83
11	6	ROW CULTIVATOR	20.0	140.0	5.091	1.000	\$1.86	\$1.20	\$1.69	\$1.24	\$0.28	\$6.27
12	6	SPRAYER, SADDLE MTD BC	20.0	140.0	7.879	1.000	\$0.98	\$0.77	\$1.12	\$0.81	\$0.18	\$3.87
	6	HERBICIDE	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	6	PICKUP, WATER TANK	20.0	170.0	8.485	0.060	\$0.06	\$0.05	\$0.03	\$0.01	\$0.00	\$0.15
13	6	ROW CULTIVATOR	20.0	140.0	5.091	1.000	\$1.86	\$1.20	\$1.69	\$1.24	\$0.28	\$6.27
	6	SPRAYER, DIR 8 ROW @ 30"	20.0	0.0	5.091	1.000	\$0.20	\$0.00	\$0.49	\$0.27	\$0.06	\$1.02
	6		0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	6	PICKUP, WATER TANK	20.0	170.0	8.485	0.060	\$0.06	\$0.05	\$0.03	\$0.01	\$0.00	\$0.15
14	7	ROW CULTIVATOR	20.0	140.0	5.091	1.000	\$1.86	\$1.20	\$1.69	\$1.24	\$0.28	\$6.27
15	7	DITCHER, REAR MTD POWER	3.0	140.0	0.436	0.010	\$0.15	\$0.14	\$0.29	\$0.20	\$0.04	\$0.83
16	7	LEVEE DISK-BUILD	9.0	155.0	4.800	0.150	\$0.24	\$0.21	\$0.27	\$0.20	\$0.05	\$0.97
17	7	BLADE- 8', BUTT LEVEES	8.0	85.0	1.745	0.050	\$0.09	\$0.11	\$0.15	\$0.13	\$0.03	\$0.51
18	7	FLOOD IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
19	8	LEVEE DISK-BUILD	9.0	155.0	4.800	0.100	\$0.16	\$0.14	\$0.18	\$0.14	\$0.03	\$0.65
20	8	FLOOD IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
21	8	LEVEE DISK-BUILD	9.0	155.0	4.800	0.100	\$0.16	\$0.14	\$0.18	\$0.14	\$0.03	\$0.65
22	8	FLOOD IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
23	9	LEVEE DISK-KNOCK	9.0	155.0	4.800	0.100	\$0.16	\$0.14	\$0.18	\$0.14	\$0.03	\$0.65
24	9	BLADE- SMOOTH LEVEES	8.0	85.0	1.745	0.050	\$0.09	\$0.11	\$0.15	\$0.13	\$0.03	\$0.51
25	10	COMBINE, 4WD, SOYBEANS	20.0	190.0	5.091	1.000	\$5.60	\$1.79	\$10.88	\$3.99	\$0.91	\$23.16
26	10	CUSTOM HAUL	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	0		0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	0		0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
SPECIFIED INTEREST												
TOTAL SPECIFIED COSTS							\$23.45	\$12.87	\$29.74	\$17.43	\$3.96	\$87.46

SEQUENCE OF OPERATIONS (CONTINUED)

ENTERPRISE: SOYBEANS, IN RICE ROTATION, 1990
 ENTERPRISE FILE NO.: SOY9003
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

MATERIAL AND/OR MISCELLANEOUS

OPER- ATION NO. (A)	CHEMICAL TRADE NAME OR ITEM (B)	FORMU- LATION (UNIT) (C)	UNIT RATE (MEASURE) (D)	PRICE PER UNIT (E)	PRODUCT RATE (ACRE) (F)	ROW WIDTH (INCHES) (G)	BAND WIDTH (INCHES) (H)	PERCENT COVERED (I)	OPER- ATING COST (J)	OWNER- SHIP COST (K)	LABOR COST (L)	TOTAL SPECIFIED COST (M)
1								0.00%	\$0.00		\$0.43	\$4.77
2								0.00%	\$0.00		\$0.43	\$4.77
3								0.00%	\$0.00		\$0.50	\$5.06
4								0.00%	\$0.00		\$0.68	\$5.86
5	CSTM AP FERT GRND		ACRE	\$2.500	1.000			100.00%	\$2.50		\$0.00	\$2.50
	POTASH (MATERIAL)		POUND	\$0.080	175.000			100.00%	\$14.00		\$0.00	\$14.00
	PHOSPHATE (MATERIAL)		POUND	\$0.094	90.000			100.00%	\$8.46		\$0.00	\$8.46
6								0.00%	\$0.00		\$0.50	\$5.06
7								0.00%	\$0.00		\$0.53	\$4.94
	DUAL	8EC	PINT	\$6.354	2.000			100.00%	\$12.71		\$0.00	\$13.34
								0.00%	\$0.00		\$0.00	\$0.29
8	SOYBEAN SEED		POUND	\$0.212	45.000			100.00%	\$9.54		\$1.31	\$17.27
	SEED TREATMENT		ACRE	\$1.463	1.000			100.00%	\$1.46		\$0.00	\$1.46
9	CSTM LASER SURVEY		ACRE	\$1.25	1.000			100.00%	\$1.25		\$0.00	\$1.25
10								0.00%	\$0.00		\$0.11	\$0.94
11								0.00%	\$0.00		\$0.98	\$7.25
12	BLAZER	2L	PINT	\$6.292	1.000	30	15	50.00%	\$3.15		\$0.79	\$7.80
	BASAGRAN	4L	PINT	\$6.650	1.000	30	15	50.00%	\$3.33		\$0.00	\$3.33
								0.00%	\$0.00		\$0.00	\$0.15
13								0.00%	\$0.00		\$1.22	\$7.49
	2,4-DB	2#/GAL	PINT	\$2.500	0.800	30	15	50.00%	\$1.00		\$0.00	\$2.02
	GRAMOXONE	1.5#/GAL	PINT	\$4.138	0.670	30	15	50.00%	\$1.39		\$0.00	\$1.39
								0.00%	\$0.00		\$0.00	\$0.15
14								0.00%	\$0.00		\$0.98	\$7.25
15								0.00%	\$0.00		\$0.11	\$0.94
16								0.00%	\$0.00		\$0.16	\$1.13
17								0.00%	\$0.00		\$0.14	\$0.65
18	FLOOD IRRIGATION		AC IN	\$1.403	4.000			100.00%	\$5.61	\$5.84	\$0.00	\$11.45
19								0.00%	\$0.00		\$0.10	\$0.75
20	FLOOD IRRIGATION		AC IN	\$1.403	4.000			100.00%	\$5.61	\$5.84	\$0.00	\$11.45
21								0.00%	\$0.00		\$0.10	\$0.75
22	FLOOD IRRIGATION		AC IN	\$1.403	4.000			100.00%	\$5.61	\$5.84	\$0.00	\$11.45
23								0.00%	\$0.00		\$0.10	\$0.75
24								0.00%	\$0.00		\$0.14	\$0.65
25								0.00%	\$0.00		\$0.98	\$24.14
26	HAULING CHARGE		BUSHEL	\$0.150	40.000			100.00%	\$6.00		\$0.00	\$6.00
								0.00%	\$0.00		\$0.00	\$0.00
								0.00%	\$0.00		\$0.00	\$0.00

\$81.61 \$17.52 \$10.32 \$204.59

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

INFORMATION PRESENTED IN THIS DOCUMENT IS PREPARED SOLELY AS A GENERAL GUIDE AND IS NOT INTENDED TO RECOGNIZE OR PREDICT THE COSTS AND RETURNS FROM ANY ONE PARTICULAR FARM OR RANCH OPERATION

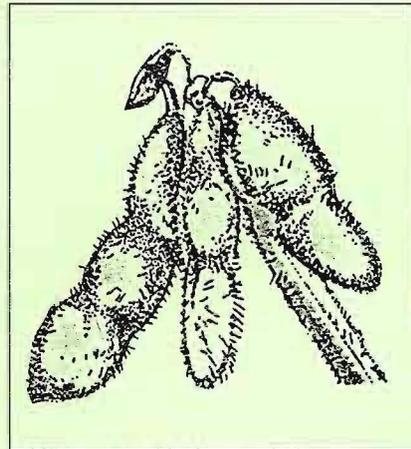
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ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS

EXTENSION TECHNICAL BULLETIN NO. 79

SOYBEANS

LOAMY SOILS, CENTER PIVOT IRRIGATION,
TOWABLE, 260 ACRES



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UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAM COMMITTEE

Lanny O. Ashlock, Chairman	Ford L. Baldwin
Claude M. Bonner	Jerry Don Clark
Charlie Guy	Gary Huitink
Donald R. Johnson	Edward J. Jordan
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THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$14.00	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$15.03	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$10.69	
REPAIRS	\$20.82	
LABOR	\$8.65	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.33	
REPAIRS	\$6.01	
IRRIGATION LABOR	\$2.49	
CUSTOM SPREAD	\$2.50	
CUSTOM HAUL	\$6.00	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$6.24	

TOTAL SPECIFIED OPERATING COSTS \$119.67

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST					
YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00
	\$4.52	\$3.94	\$2.99	\$2.43	\$2.26

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$8.49	
INTEREST	\$7.01	
EQUIPMENT:		
DEPRECIATION	\$7.30	
INTEREST	\$4.00	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$16.13	
INTEREST	\$14.03	
TAXES & INSURANCE	\$6.60	
INTEREST	\$0.73	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$79.28

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$198.95

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST					
YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00
	\$7.57	\$6.58	\$4.97	\$4.01	\$3.73

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9004
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: CENTER PIVOT, TOWABLE, 260 ACRES

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$34.32	\$42.89	\$51.47
OWNERSHIP INTEREST	\$23.82	\$29.78	\$35.74
REPAIRS	\$21.46	\$26.82	\$32.19
HERBICIDE	\$12.02	\$15.03	\$18.04
FERTILIZER	\$11.20	\$14.00	\$16.80
HIRED LABOR	\$8.91	\$11.14	\$13.37
MACHINERY FUEL & OIL	\$8.55	\$10.69	\$12.83
SEED	\$7.63	\$9.54	\$11.45
IRRIGATION FUEL & OIL	\$6.67	\$8.33	\$10.00
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
INTEREST ON OP. CAP.	\$4.99	\$6.24	\$7.49
HAUL (CUSTOM HIRE)	\$4.80	\$6.00	\$7.20
FARM TAXES	\$4.23	\$5.28	\$6.34
SPREAD (CUSTOM HIRE)	\$2.00	\$2.50	\$3.00
FUNGICIDE	\$1.17	\$1.46	\$1.76
FARM INSURANCE	\$1.06	\$1.32	\$1.58
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
UTILITIES			

 TOTAL SPECIFIED COST/ACRE \$159.16 \$198.95 \$238.74
 =====

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE		
	-----	-----	-----	-----
-35% OF BASE YIELD	26.00	\$6.05	\$7.57	\$9.08
-25% OF BASE YIELD	30.00	\$5.26	\$6.58	\$7.89
BASE YIELD	40.00	\$3.98	\$4.97	\$5.97
+25% OF BASE YIELD	50.00	\$3.21	\$4.01	\$4.81
+35% OF BASE YIELD	54.00	\$2.98	\$3.73	\$4.47

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9004
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: CENTER PIVOT, TOWABLE, 260 ACRES

- 20% DEVIATION FROM BASE COSTS: \$159.16 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$60.21)	(\$45.77)	(\$9.66)	\$26.45	\$40.89
	\$4.74	(\$34.05)	(\$15.58)	\$30.59	\$76.76	\$95.23
BASE PRICE =	\$5.75	(\$7.89)	\$14.61	\$70.84	\$127.08	\$149.57
	\$6.76	\$18.28	\$44.80	\$111.09	\$177.39	\$203.91
	\$7.76	\$44.44	\$74.98	\$151.34	\$227.70	\$258.24

BASE COSTS: \$198.95 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$99.56)	(\$85.24)	(\$49.45)	(\$13.66)	\$0.66
	\$4.74	(\$73.39)	(\$55.05)	(\$9.20)	\$36.66	\$55.00
BASE PRICE =	\$5.75	(\$47.23)	(\$24.87)	\$31.05	\$86.97	\$109.34
	\$6.76	(\$21.07)	\$5.32	\$71.30	\$137.28	\$163.67
	\$7.76	\$5.09	\$35.51	\$111.55	\$187.59	\$218.01

+ 20% DEVIATION FROM BASE COSTS: \$238.74 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$138.90)	(\$124.71)	(\$89.24)	(\$53.76)	(\$39.57)
	\$4.74	(\$112.74)	(\$94.53)	(\$48.99)	(\$3.45)	\$14.77
BASE PRICE =	\$5.75	(\$86.58)	(\$64.34)	(\$8.74)	\$46.86	\$69.10
	\$6.76	(\$60.42)	(\$34.15)	\$31.51	\$97.18	\$123.44
	\$7.76	(\$34.25)	(\$3.96)	\$71.76	\$147.49	\$177.78

SEQUENCE OF OPERATIONS

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9004
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: CENTER PIVOT, TOWABLE, 260 ACRE

MACHINERY COST

OPER- ATION NO. (A)	DATE (B)	OPERATION (C)	WIDTH (FEET) (D)	HORSE POWER PTO (E)	PERFORMANCE RATE (AC/HR) (F)	TIMES OVER (NO.) (G)	OPERATING COST		OWNERSHIP COST			TOTAL COST (M)	
							REPAIRS & MAINTENANCE (H)	FUEL, OIL & LUB (I)	DEPRE- CIATION (J)	INTEREST (K)	TAXES & INSURANCE (L)		
1		3 DISK, MC 9.0" SPACING	26.7	175.0	11.638	1.000	\$1.16	\$0.66	\$1.34	\$0.97	\$0.22	\$4.34	
2		4 DISK, MC 9.0" SPACING	26.7	175.0	11.638	1.000	\$1.16	\$0.66	\$1.34	\$0.97	\$0.22	\$4.34	
3		4 APPLY FERTILIZER	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		4	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
4		4 FIELD CULTIVATOR	25.5	175.0	9.891	1.000	\$1.26	\$0.77	\$1.31	\$0.99	\$0.23	\$4.56	
5		5 FIELD CULTIVATOR	25.5	175.0	9.891	1.000	\$1.26	\$0.77	\$1.31	\$0.99	\$0.23	\$4.56	
6		5 TRIPLE - K	26.7	175.0	11.638	1.000	\$1.25	\$0.66	\$1.28	\$1.00	\$0.23	\$4.40	
		5 SPRAYER, SADDLE MTD BC	26.7	0.0	11.638	1.000	\$0.13	\$0.00	\$0.31	\$0.17	\$0.04	\$0.64	
		5 HERBICIDE	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		5 PICKUP, WATER TANK	20.0	170.0	8.485	0.120	\$0.11	\$0.10	\$0.06	\$0.02	\$0.00	\$0.29	
7		5 PLANTER 8 ROW @ 30"	20.0	140.0	7.309	1.000	\$2.02	\$0.83	\$2.21	\$1.11	\$0.25	\$6.43	
		5	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
8		6 ROW CULTIVATOR	20.0	140.0	5.091	1.000	\$1.86	\$1.20	\$1.69	\$1.24	\$0.28	\$6.27	
9		6 SPRAYER, SADDLE MTD BC	20.0	140.0	7.879	1.000	\$0.98	\$0.77	\$1.12	\$0.81	\$0.18	\$3.87	
		6 PICKUP, WATER TANK	20.0	170.0	8.485	0.060	\$0.06	\$0.05	\$0.03	\$0.01	\$0.00	\$0.15	
10		6 ROW CULTIVATOR	20.0	140.0	5.091	1.000	\$1.86	\$1.20	\$1.69	\$1.24	\$0.28	\$6.27	
		6 SPRAYER, DIR 8 ROW @ 30"	20.0	0.0	5.091	1.000	\$0.20	\$0.00	\$0.49	\$0.27	\$0.06	\$1.02	
		6 PICKUP, WATER TANK	20.0	170.0	8.485	0.060	\$0.06	\$0.05	\$0.03	\$0.01	\$0.00	\$0.15	
11		6 CENTER PIVOT IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
12		7 ROW CULTIVATOR	20.0	140.0	5.091	1.000	\$1.86	\$1.20	\$1.69	\$1.24	\$0.28	\$6.27	
13		7 CENTER PIVOT IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
14		7 CENTER PIVOT IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
15		8 CENTER PIVOT IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
16		9 CENTER PIVOT IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
17		9 CENTER PIVOT IRRIGATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
18		10 COMBINE, 4WD, SOYBEANS	20.0	190.0	5.091	1.000	\$5.60	\$1.79	\$10.88	\$3.99	\$0.91	\$23.16	
19		10 CUSTOM HAUL	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
20		11 LINE + APPLICATION	0.0	0.0	0.000	1.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		0	0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		0	0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
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		0	0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		0	0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
		0	0.0	0.0	0.000	0.000	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
SPECIFIED INTEREST													
TOTAL SPECIFIED COSTS								\$20.82	\$10.69	\$26.77	\$15.02	\$3.41	\$76.71

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

INFORMATION PRESENTED IN THIS DOCUMENT IS PREPARED SOLELY AS A GENERAL GUIDE AND IS NOT INTENDED TO RECOGNIZE OR PREDICT THE COSTS AND RETURNS FROM ANY ONE PARTICULAR FARM OR RANCH OPERATION

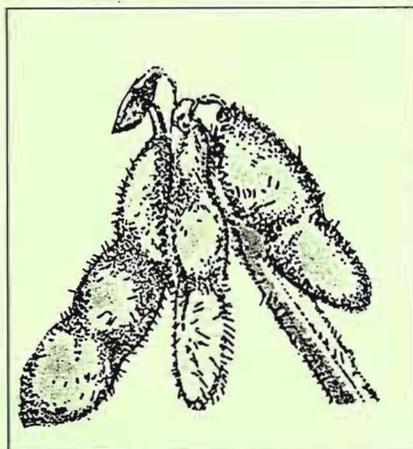
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**ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS**

EXTENSION TECHNICAL BULLETIN NO. 80

SOYBEANS

DRILLED, LOAMY SOILS



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**UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION**

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

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THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$12.72	
FERTILIZER	\$9.60	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$4.73	
FUNGICIDE	\$1.95	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$6.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$6.28	
REPAIRS	\$13.66	
LABOR	\$4.66	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$0.00	
REPAIRS	\$0.00	
IRRIGATION LABOR	\$0.00	
CUSTOM SPREAD	\$2.50	
CUSTOM HAUL	\$3.75	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$5.16	

TOTAL SPECIFIED OPERATING COSTS \$98.92

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHELS

YIELD	16.25	18.75	25.00	31.25	33.75
PER UNIT BREAKEVEN PRICE	\$6.00	\$5.22	\$3.96	\$3.20	\$2.97

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$4.49	
INTEREST	\$3.70	
EQUIPMENT:		
DEPRECIATION	\$4.84	
INTEREST	\$2.96	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.93	
INTEREST	\$4.00	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
TAXES & INSURANCE	\$2.42	
INTEREST	\$0.27	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$33.62

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$132.55

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHELS

YIELD	16.25	18.75	25.00	31.25	33.75
PER UNIT BREAKEVEN PRICE	\$8.07	\$7.02	\$5.30	\$4.27	\$3.97

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, DRILLED, 1990
 ENTERPRISE FILE NO.: SOY9005
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: NONE

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
HERBICIDE	\$19.78	\$24.73	\$29.68
DEPRECIATION	\$16.21	\$20.26	\$24.32
REPAIRS	\$10.93	\$13.66	\$16.40
SEED	\$10.18	\$12.72	\$15.26
OWNERSHIP INTEREST	\$8.75	\$10.94	\$13.12
FERTILIZER	\$7.68	\$9.60	\$11.52
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
MACHINERY FUEL & OIL	\$5.02	\$6.28	\$7.53
AERIAL APPLI. (CUSTOM HIRE)	\$4.80	\$6.00	\$7.20
INTEREST ON OP. CAP.	\$4.13	\$5.16	\$6.19
HIRED LABOR	\$3.73	\$4.66	\$5.59
HAUL (CUSTOM HIRE)	\$3.00	\$3.75	\$4.50
SPREAD (CUSTOM HIRE)	\$2.00	\$2.50	\$3.00
FUNGICIDE	\$1.56	\$1.95	\$2.34
FARM TAXES	\$1.55	\$1.94	\$2.33
FARM INSURANCE	\$0.39	\$0.48	\$0.58
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
IRRIGATION FUEL & OIL			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$106.04 \$132.55 \$159.06

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE		
-35% OF BASE YIELD	16.25	\$6.46	\$8.07	\$9.69
-25% OF BASE YIELD	18.75	\$5.61	\$7.02	\$8.42
BASE YIELD	25.00	\$4.24	\$5.30	\$6.36
+25% OF BASE YIELD	31.25	\$3.42	\$4.27	\$5.13
+35% OF BASE YIELD	33.75	\$3.17	\$3.97	\$4.76

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, DRILLED, 1990
 ENTERPRISE FILE NO.: SOY9005
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: NONE

- 20% DEVIATION FROM BASE COSTS: \$106.04 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHEL					
	16.25	18.75	25.00	31.25	33.75	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$44.19)	(\$35.17)	(\$12.60)	\$9.97	\$19.00
	\$4.74	(\$27.84)	(\$16.30)	\$12.56	\$41.41	\$52.96
BASE PRICE =	\$5.75	(\$11.49)	\$2.57	\$37.71	\$72.86	\$86.92
	\$6.76	\$4.86	\$21.43	\$62.87	\$104.30	\$120.88
	\$7.76	\$21.21	\$40.30	\$88.03	\$135.75	\$154.84

BASE COSTS: \$132.55 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHEL					
	16.25	18.75	25.00	31.25	33.75	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$70.43)	(\$61.48)	(\$39.11)	(\$16.74)	(\$7.79)
	\$4.74	(\$54.08)	(\$42.61)	(\$13.95)	\$14.71	\$26.17
BASE PRICE =	\$5.75	(\$37.72)	(\$23.74)	\$11.20	\$46.15	\$60.13
	\$6.76	(\$21.37)	(\$4.88)	\$36.36	\$77.60	\$94.09
	\$7.76	(\$5.02)	\$13.99	\$61.52	\$109.04	\$128.05

+ 20% DEVIATION FROM BASE COSTS: \$159.06 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHEL					
	16.25	18.75	25.00	31.25	33.75	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$96.66)	(\$87.79)	(\$65.62)	(\$43.45)	(\$34.58)
	\$4.74	(\$80.31)	(\$68.92)	(\$40.46)	(\$12.00)	(\$0.62)
BASE PRICE =	\$5.75	(\$63.96)	(\$50.06)	(\$15.31)	\$19.45	\$33.35
	\$6.76	(\$47.60)	(\$31.19)	\$9.85	\$50.89	\$67.31
	\$7.76	(\$31.25)	(\$12.32)	\$35.01	\$82.34	\$101.27

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

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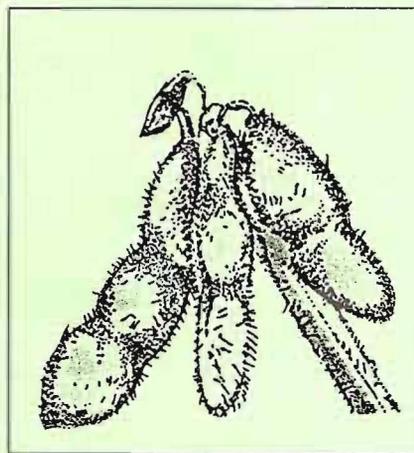
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ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS

EXTENSION TECHNICAL BULLETIN NO. 81

SOYBEANS

FOLLOWING WHEAT,
LOAMY SOILS



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AGRICULTURAL ECONOMICS SECTION

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAM COMMITTEE

Lanny O. Ashlock, Chairman	Ford L. Baldwin
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Phil L. Tacker	Tony E. Windham

THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$9.60	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$10.23	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$7.25	
REPAIRS	\$14.92	
LABOR	\$5.99	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$0.00	
REPAIRS	\$0.00	
IRRIGATION LABOR	\$0.00	
CUSTOM SPREAD	\$1.25	
CUSTOM HAUL	\$3.00	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$3.91	

TOTAL SPECIFIED OPERATING COSTS \$75.07

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHELS

	13.00	15.00	20.00	25.00	27.00
	\$5.69	\$4.95	\$3.75	\$3.03	\$2.82

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$5.09	
INTEREST	\$4.20	
EQUIPMENT:		
DEPRECIATION	\$4.33	
INTEREST	\$2.22	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.96	
INTEREST	\$4.01	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
TAXES & INSURANCE	\$2.37	
INTEREST	\$0.26	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$33.43

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$108.50

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHELS

	13.00	15.00	20.00	25.00	27.00
	\$8.26	\$7.18	\$5.43	\$4.37	\$4.06

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9006
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: NONE

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$16.30	\$20.38	\$24.45
REPAIRS	\$11.94	\$14.92	\$17.91
OWNERSHIP INTEREST	\$8.55	\$10.68	\$12.82
HERBICIDE	\$8.19	\$10.23	\$12.28
FERTILIZER	\$7.68	\$9.60	\$11.52
SEED	\$7.63	\$9.54	\$11.45
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
MACHINERY FUEL & OIL	\$5.80	\$7.25	\$8.70
HIRED LABOR	\$4.79	\$5.99	\$7.19
INTEREST ON OP. CAP.	\$3.13	\$3.91	\$4.70
HAUL (CUSTOM HIRE)	\$2.40	\$3.00	\$3.60
FARM TAXES	\$1.52	\$1.90	\$2.27
FUNGICIDE	\$1.17	\$1.46	\$1.76
SPREAD (CUSTOM HIRE)	\$1.00	\$1.25	\$1.50
FARM INSURANCE	\$0.38	\$0.47	\$0.57
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
IRRIGATION FUEL & OIL			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$86.80 \$108.50 \$130.20

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE		
-35% OF BASE YIELD	13.00	\$6.61	\$8.26	\$9.91
-25% OF BASE YIELD	15.00	\$5.74	\$7.18	\$8.62
BASE YIELD	20.00	\$4.34	\$5.43	\$6.51
+25% OF BASE YIELD	25.00	\$3.50	\$4.37	\$5.25
+35% OF BASE YIELD	27.00	\$3.25	\$4.06	\$4.87

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9006
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: NONE

- 20% DEVIATION FROM BASE COSTS: \$86.80 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	13.00	15.00	20.00	25.00	27.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$37.33)	(\$30.11)	(\$12.05)	\$6.00	\$13.23
	\$4.74	(\$24.25)	(\$15.01)	\$8.07	\$31.16	\$40.39
BASE PRICE =	\$5.75	(\$11.16)	\$0.08	\$28.20	\$56.32	\$67.56
	\$6.76	\$1.92	\$15.18	\$48.32	\$81.47	\$94.73
	\$7.76	\$15.00	\$30.27	\$68.45	\$106.63	\$121.90

BASE COSTS: \$108.50 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	13.00	15.00	20.00	25.00	27.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$58.81)	(\$51.65)	(\$33.75)	(\$15.86)	(\$8.70)
	\$4.74	(\$45.72)	(\$36.55)	(\$13.63)	\$9.30	\$18.47
BASE PRICE =	\$5.75	(\$32.64)	(\$21.46)	\$6.50	\$34.46	\$45.64
	\$6.76	(\$19.56)	(\$6.37)	\$26.62	\$59.61	\$72.81
	\$7.76	(\$6.48)	\$8.73	\$46.75	\$84.77	\$99.98

+ 20% DEVIATION FROM BASE COSTS: \$130.20 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	13.00	15.00	20.00	25.00	27.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$80.28)	(\$73.19)	(\$55.45)	(\$37.71)	(\$30.62)
	\$4.74	(\$67.20)	(\$58.10)	(\$35.33)	(\$12.56)	(\$3.45)
BASE PRICE =	\$5.75	(\$54.12)	(\$43.00)	(\$15.20)	\$12.60	\$23.72
	\$6.76	(\$41.04)	(\$27.91)	\$4.92	\$37.76	\$50.89
	\$7.76	(\$27.96)	(\$12.81)	\$25.05	\$62.91	\$78.06

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

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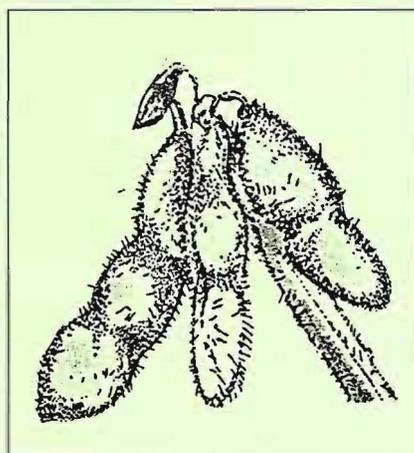
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**ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS**

EXTENSION TECHNICAL BULLETIN NO. 82

SOYBEANS

**FOLLOWING WHEAT, LOAMY SOILS,
CENTER PIVOT IRRIGATION, TOWABLE, 260 ACRES**



AUTHORS

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BILLY E. HERRINGTON, JR.
TONY E. WINDHAM**

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EXTENSION ECONOMISTS - MANAGEMENT

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The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

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SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$14.00	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$10.23	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$7.25	
REPAIRS	\$15.02	
LABOR	\$5.99	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.33	
REPAIRS	\$6.01	
IRRIGATION LABOR	\$2.49	
CUSTOM SPREAD	\$1.25	
CUSTOM HAUL	\$5.25	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$5.21	

TOTAL SPECIFIED OPERATING COSTS \$99.94

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHELS

22.75	26.25	35.00	43.75	47.25
\$4.31	\$3.75	\$2.86	\$2.32	\$2.16

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$5.09	
INTEREST	\$4.20	
EQUIPMENT:		
DEPRECIATION	\$4.56	
INTEREST	\$2.34	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.96	
INTEREST	\$4.01	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$16.13	
INTEREST	\$14.03	
TAXES & INSURANCE	\$5.59	
INTEREST	\$0.61	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$67.51

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$167.46

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHELS

22.75	26.25	35.00	43.75	47.25
\$7.28	\$6.33	\$4.78	\$3.86	\$3.59

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9007
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: CENTER PIVOT, TOWABLE, 260 ACRES

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$29.38	\$36.73	\$44.07
OWNERSHIP INTEREST	\$20.16	\$25.20	\$30.24
REPAIRS	\$16.82	\$21.03	\$25.23
FERTILIZER	\$11.20	\$14.00	\$16.80
HERBICIDE	\$8.19	\$10.23	\$12.28
SEED	\$7.63	\$9.54	\$11.45
HIRED LABOR	\$6.79	\$8.48	\$10.18
IRRIGATION FUEL & OIL	\$6.67	\$8.33	\$10.00
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
MACHINERY FUEL & OIL	\$5.80	\$7.25	\$8.70
HAUL (CUSTOM HIRE)	\$4.20	\$5.25	\$6.30
INTEREST ON OP. CAP.	\$4.17	\$5.21	\$6.25
FARM TAXES	\$3.58	\$4.47	\$5.36
FUNGICIDE	\$1.17	\$1.46	\$1.76
SPREAD (CUSTOM HIRE)	\$1.00	\$1.25	\$1.50
FARM INSURANCE	\$0.89	\$1.12	\$1.34
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$133.97 \$167.46 \$200.95

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS			
	YIELD	BREAKEVEN PRICE	
-35% OF BASE YIELD	22.75	\$5.82	\$8.73
-25% OF BASE YIELD	26.25	\$5.06	\$7.59
BASE YIELD	35.00	\$3.83	\$5.74
+25% OF BASE YIELD	43.75	\$3.09	\$4.63
+35% OF BASE YIELD	47.25	\$2.87	\$4.30

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9007
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: CENTER PIVOT, TOWABLE, 260 ACRES

- 20% DEVIATION FROM BASE COSTS: \$133.97 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - - - - RETURNS PER ACRE - - - - - - - - - -					
	\$3.74	(\$47.39)	(\$34.75)	(\$3.15)	\$28.44	\$41.08
	\$4.74	(\$24.49)	(\$8.33)	\$32.07	\$72.47	\$88.63
BASE PRICE =	\$5.75	(\$1.60)	\$18.08	\$67.28	\$116.49	\$136.17
	\$6.76	\$21.29	\$44.49	\$102.50	\$160.51	\$183.72
	\$7.76	\$44.18	\$70.91	\$137.72	\$204.54	\$231.26

BASE COSTS: \$167.46 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - - - - RETURNS PER ACRE - - - - - - - - - -					
	\$3.74	(\$80.49)	(\$67.96)	(\$36.64)	(\$5.33)	\$7.20
	\$4.74	(\$57.60)	(\$41.55)	(\$1.43)	\$38.70	\$54.75
BASE PRICE =	\$5.75	(\$34.71)	(\$15.13)	\$33.79	\$82.72	\$102.29
	\$6.76	(\$11.81)	\$11.28	\$69.01	\$126.74	\$149.84
	\$7.76	\$11.08	\$37.69	\$104.23	\$170.77	\$197.38

+ 20% DEVIATION FROM BASE COSTS: \$200.95 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - - - - - - RETURNS PER ACRE - - - - - - - - - -					
	\$3.74	(\$113.59)	(\$101.18)	(\$70.14)	(\$39.09)	(\$26.68)
	\$4.74	(\$90.70)	(\$74.76)	(\$34.92)	\$4.93	\$20.87
BASE PRICE =	\$5.75	(\$67.81)	(\$48.35)	\$0.30	\$48.95	\$68.41
	\$6.76	(\$44.92)	(\$21.94)	\$35.52	\$92.98	\$115.96
	\$7.76	(\$22.03)	\$4.48	\$70.74	\$137.00	\$163.50

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

INFORMATION PRESENTED IN THIS DOCUMENT IS PREPARED SOLELY AS A GENERAL GUIDE AND IS NOT INTENDED TO RECOGNIZE OR PREDICT THE COSTS AND RETURNS FROM ANY ONE PARTICULAR FARM OR RANCH OPERATION

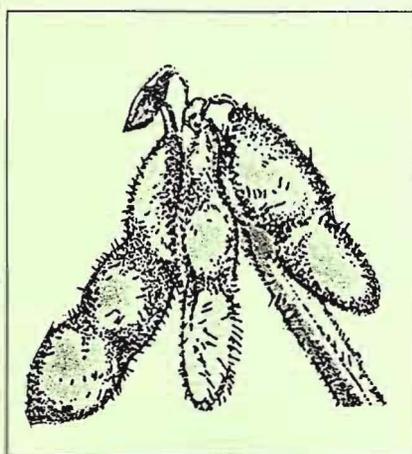
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**ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS**

EXTENSION TECHNICAL BULLETIN NO. 83

SOYBEANS

CLAY SOILS



AUTHORS

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**UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION**

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

Lanny O. Ashlock, Chairman	Ford L. Baldwin
Claude M. Bonner	Jerry Don Clark
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THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$0.00	
LIME + APPLICATION	\$0.00	
HERBICIDE	\$17.29	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$8.72	
REPAIRS	\$17.72	
LABOR	\$7.19	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$0.00	
REPAIRS	\$0.00	
IRRIGATION LABOR	\$0.00	
CUSTOM SPREAD	\$0.00	
CUSTOM HAUL	\$3.30	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$3.59	

TOTAL SPECIFIED OPERATING COSTS \$68.81

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHEL

14.30	16.50	22.00	27.50	29.70
\$4.73	\$4.12	\$3.13	\$2.53	\$2.36

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$6.58	
INTEREST	\$5.43	
EQUIPMENT:		
DEPRECIATION	\$6.27	
INTEREST	\$3.38	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
TAXES & INSURANCE	\$2.91	
INTEREST	\$0.32	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$39.87

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$108.68

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHEL

14.30	16.50	22.00	27.50	29.70
\$7.51	\$6.53	\$4.94	\$3.98	\$3.70

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9008
 LOCATION: ARKANSAS
 SOILS TYPE: CLAY
 IRRIGATION METHOD: NONE

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$19.06	\$23.82	\$28.59
REPAIRS	\$14.18	\$17.72	\$21.26
HERBICIDE	\$13.83	\$17.29	\$20.75
OWNERSHIP INTEREST	\$10.51	\$13.14	\$15.76
SEED	\$7.63	\$9.54	\$11.45
MACHINERY FUEL & OIL	\$6.98	\$8.72	\$10.46
HIRED LABOR	\$5.75	\$7.19	\$8.63
INTEREST ON OP. CAP.	\$2.87	\$3.59	\$4.30
HAUL (CUSTOM HIRE)	\$2.64	\$3.30	\$3.96
FARM TAXES	\$1.86	\$2.33	\$2.80
FUNGICIDE	\$1.17	\$1.46	\$1.76
FARM INSURANCE	\$0.47	\$0.58	\$0.70
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FERTILIZER			
FINANCIAL SERVICES			
INSECTICIDE			
IRRIGATION FUEL & OIL			
LAND CHARGE			
LEASE PAYMENTS			
LIME + APPLICATION			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
SPREAD (CUSTOM HIRE)			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$86.94 \$108.68 \$130.42

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE		
-35% OF BASE YIELD	14.30	\$6.01	\$7.51	\$9.02
-25% OF BASE YIELD	16.50	\$5.23	\$6.53	\$7.84
BASE YIELD	22.00	\$3.95	\$4.94	\$5.93
+25% OF BASE YIELD	27.50	\$3.19	\$3.98	\$4.78
+35% OF BASE YIELD	29.70	\$2.96	\$3.70	\$4.44

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9008
 LOCATION: ARKANSAS
 SOILS TYPE: CLAY
 IRRIGATION METHOD: NONE

- 20% DEVIATION FROM BASE COSTS: \$86.94 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	14.30	16.50	22.00	27.50	29.70	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$32.52)	(\$24.58)	(\$4.72)	\$15.14	\$23.08
	\$4.74	(\$18.13)	(\$7.98)	\$17.42	\$42.81	\$52.97
BASE PRICE =	\$5.75	(\$3.74)	\$8.63	\$39.56	\$70.48	\$82.86
	\$6.76	\$10.64	\$25.23	\$61.69	\$98.16	\$112.74
	\$7.76	\$25.03	\$41.83	\$83.83	\$125.83	\$142.63

BASE COSTS: \$108.68 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	14.30	16.50	22.00	27.50	29.70	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$54.02)	(\$46.14)	(\$26.46)	(\$6.77)	\$1.10
	\$4.74	(\$39.63)	(\$29.54)	(\$4.32)	\$20.90	\$30.99
BASE PRICE =	\$5.75	(\$25.24)	(\$12.94)	\$17.82	\$48.57	\$60.88
	\$6.76	(\$10.85)	\$3.67	\$39.96	\$76.25	\$90.76
	\$7.76	\$3.54	\$20.27	\$62.09	\$103.92	\$120.65

+ 20% DEVIATION FROM BASE COSTS: \$130.42 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	14.30	16.50	22.00	27.50	29.70	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$75.51)	(\$67.70)	(\$48.19)	(\$28.68)	(\$20.88)
	\$4.74	(\$61.12)	(\$51.10)	(\$26.05)	(\$1.01)	\$9.01
BASE PRICE =	\$5.75	(\$46.73)	(\$34.50)	(\$3.92)	\$26.66	\$38.90
	\$6.76	(\$32.34)	(\$17.89)	\$18.22	\$54.34	\$68.78
	\$7.76	(\$17.95)	(\$1.29)	\$40.36	\$82.01	\$98.67

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
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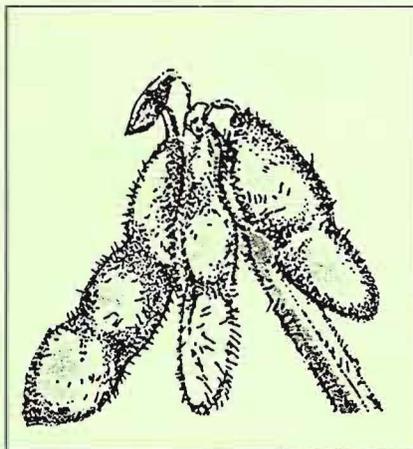
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ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS

EXTENSION TECHNICAL BULLETIN NO. 84

SOYBEANS

CLAY SOILS, CENTER PIVOT
IRRIGATION, NON-TOWABLE, 130 ACRES



AUTHORS

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EXTENSION ECONOMISTS - MANAGEMENT

UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

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A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

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Donald R. Johnson	Edward J. Jordan
Gus M. Lorenz	M.C. McDaniel
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Roy N. Sharp	Clifford S. Snyder
Phil L. Tacker	Tony E. Windham

THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$0.00	
LIME + APPLICATION	\$0.00	
HERBICIDE	\$17.29	
FUNGICIDE	\$1.46	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$0.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$9.92	
REPAIRS	\$19.58	
LABOR	\$8.17	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.33	
REPAIRS	\$5.81	
IRRIGATION LABOR	\$1.25	
CUSTOM SPREAD	\$0.00	
CUSTOM HAUL	\$6.00	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$0.00	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$4.80	

TOTAL SPECIFIED OPERATING COSTS \$92.14

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHEL

	26.00	30.00	40.00	50.00	54.00
	\$3.46	\$3.02	\$2.30	\$1.87	\$1.75

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$7.69	
INTEREST	\$6.34	
EQUIPMENT:		
DEPRECIATION	\$6.85	
INTEREST	\$3.70	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$26.49	
INTEREST	\$22.58	
TAXES & INSURANCE	\$8.33	
INTEREST	\$0.92	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$97.88

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$190.03

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHEL

	26.00	30.00	40.00	50.00	54.00
	\$7.22	\$6.28	\$4.75	\$3.83	\$3.56

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9009
 LOCATION: ARKANSAS
 SOILS TYPE: CLAY
 IRRIGATION METHOD: CENTER PIVOT, NON-TOWABLE, 130 ACRES

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$41.60	\$52.00	\$62.40
OWNERSHIP INTEREST	\$30.04	\$37.55	\$45.06
REPAIRS	\$20.31	\$25.39	\$30.46
HERBICIDE	\$13.83	\$17.29	\$20.75
MACHINERY FUEL & OIL	\$7.93	\$9.92	\$11.90
SEED	\$7.63	\$9.54	\$11.45
HIRED LABOR	\$7.53	\$9.41	\$11.29
IRRIGATION FUEL & OIL	\$6.67	\$8.33	\$10.00
FARM TAXES	\$5.33	\$6.66	\$7.99
HAUL (CUSTOM HIRE)	\$4.80	\$6.00	\$7.20
INTEREST ON OP. CAP.	\$3.84	\$4.80	\$5.76
FARM INSURANCE	\$1.33	\$1.67	\$2.00
FUNGICIDE	\$1.17	\$1.46	\$1.76
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FERTILIZER			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
LIME + APPLICATION			
MACHINE HIRE			
MANAGEMENT			
MISCELLANEOUS			
OVERHEAD			
SPREAD (CUSTOM HIRE)			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$152.02 \$190.03 \$228.03

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE	
-35% OF BASE YIELD	26.00	\$5.78	\$8.67
-25% OF BASE YIELD	30.00	\$5.03	\$7.54
BASE YIELD	40.00	\$3.80	\$5.70
+25% OF BASE YIELD	50.00	\$3.07	\$4.60
+35% OF BASE YIELD	54.00	\$2.85	\$4.27

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, 1990
 ENTERPRISE FILE NO.: SOY9009
 LOCATION: ARKANSAS
 SOILS TYPE: CLAY
 IRRIGATION METHOD: CENTER PIVOT, NON-TOWABLE, 130 ACRES

- 20% DEVIATION FROM BASE COSTS: \$152.02 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$53.07)	(\$38.63)	(\$2.52)	\$33.59	\$48.03
	\$4.74	(\$26.91)	(\$8.44)	\$37.73	\$83.90	\$102.37
BASE PRICE =	\$5.75	(\$0.75)	\$21.75	\$77.98	\$134.21	\$156.71
	\$6.76	\$25.41	\$51.93	\$118.23	\$184.53	\$211.04
	\$7.76	\$51.58	\$82.12	\$158.48	\$234.84	\$265.38

BASE COSTS: \$190.03 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$90.64)	(\$76.32)	(\$40.53)	(\$4.73)	\$9.58
	\$4.74	(\$64.47)	(\$46.13)	(\$0.28)	\$45.58	\$63.92
BASE PRICE =	\$5.75	(\$38.31)	(\$15.94)	\$39.97	\$95.89	\$118.26
	\$6.76	(\$12.15)	\$14.24	\$80.22	\$146.20	\$172.60
	\$7.76	\$14.01	\$44.43	\$120.47	\$196.52	\$226.93

+ 20% DEVIATION FROM BASE COSTS: \$228.03 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	26.00	30.00	40.00	50.00	54.00	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$128.20)	(\$114.01)	(\$78.53)	(\$43.05)	(\$28.86)
	\$4.74	(\$102.03)	(\$83.82)	(\$38.28)	\$7.26	\$25.47
BASE PRICE =	\$5.75	(\$75.87)	(\$53.63)	\$1.97	\$57.57	\$79.81
	\$6.76	(\$49.71)	(\$23.44)	\$42.22	\$107.88	\$134.15
	\$7.76	(\$23.55)	\$6.74	\$82.47	\$158.20	\$188.49

LIST OF PUBLICATIONS FOR ESTIMATING 1990 PRODUCTION COSTS

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

INFORMATION PRESENTED IN THIS DOCUMENT IS PREPARED SOLELY AS A GENERAL GUIDE AND IS NOT INTENDED TO RECOGNIZE OR PREDICT THE COSTS AND RETURNS FROM ANY ONE PARTICULAR FARM OR RANCH OPERATION

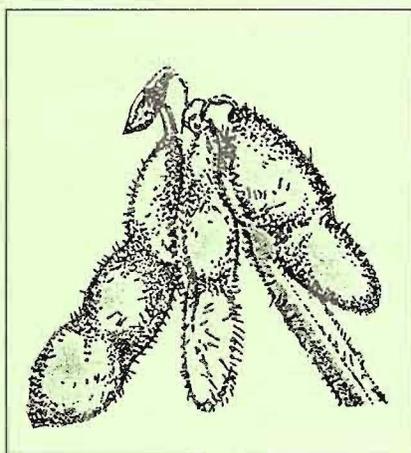
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**ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS**

EXTENSION TECHNICAL BULLETIN NO. 85

SOYBEANS

**FOLLOWING WHEAT,
LOAMY SOILS, FLOOD IRRIGATION**



AUTHORS

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EXTENSION ECONOMISTS - MANAGEMENT

**UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION**

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

Lanny O. Ashlock, Chairman	Ford L. Baldwin
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SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$9.54	
FERTILIZER	\$14.00	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$11.23	
FUNGICIDE	\$1.46	
INSECTICIDE		
DEFOLIANT		
AERIAL APPLICATION		
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$8.43	
REPAIRS	\$16.46	
LABOR	\$7.22	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.00	
REPAIRS	\$2.86	
IRRIGATION LABOR	\$5.98	
CUSTOM SPREAD	\$1.25	
CUSTOM HAUL	\$5.25	
CUSTOM DRY OR GINNING		
MISCELLANEOUS	\$1.25	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$5.55	

TOTAL SPECIFIED OPERATING COSTS \$106.38

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST
YIELD IN BUSHELS

22.75	26.25	35.00	43.75	47.25
\$4.59	\$4.00	\$3.04	\$2.46	\$2.29

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$6.17	
INTEREST	\$5.09	
EQUIPMENT:		
DEPRECIATION	\$5.68	
INTEREST	\$2.99	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.98	
INTEREST	\$4.02	
MISCELLANEOUS:		
DEPRECIATION		
INTEREST		
IRRIGATION:		
DEPRECIATION	\$8.16	
INTEREST	\$7.62	
TAXES & INSURANCE	\$4.48	
INTEREST	\$0.49	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$55.68

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$162.07

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST
YIELD IN BUSHELS

22.75	26.25	35.00	43.75	47.25
\$7.04	\$6.12	\$4.63	\$3.74	\$3.47

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9010
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
DEPRECIATION	\$24.79	\$30.99	\$37.19
OWNERSHIP INTEREST	\$16.17	\$20.21	\$24.25
REPAIRS	\$15.46	\$19.32	\$23.19
FERTILIZER	\$11.20	\$14.00	\$16.80
HIRED LABOR	\$10.56	\$13.19	\$15.83
HERBICIDE	\$8.99	\$11.23	\$13.48
SEED	\$7.63	\$9.54	\$11.45
MACHINERY FUEL & OIL	\$6.74	\$8.43	\$10.11
IRRIGATION FUEL & OIL	\$6.40	\$8.00	\$9.60
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
INTEREST ON OP. CAP.	\$4.44	\$5.55	\$6.66
HAUL (CUSTOM HIRE)	\$4.20	\$5.25	\$6.30
FARM TAXES	\$2.87	\$3.59	\$4.30
FUNGICIDE	\$1.17	\$1.46	\$1.76
MISCELLANEOUS	\$1.00	\$1.25	\$1.50
SPREAD (CUSTOM HIRE)	\$1.00	\$1.25	\$1.50
FARM INSURANCE	\$0.72	\$0.90	\$1.08
AERIAL APPLI. (CUSTOM HIRE)			
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE \$129.65 \$162.07 \$194.48

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

	YIELD	BREAKEVEN PRICE		
-35% OF BASE YIELD	22.75	\$5.63	\$7.04	\$8.45
-25% OF BASE YIELD	26.25	\$4.90	\$6.12	\$7.35
BASE YIELD	35.00	\$3.70	\$4.63	\$5.56
+25% OF BASE YIELD	43.75	\$2.99	\$3.74	\$4.48
+35% OF BASE YIELD	47.25	\$2.78	\$3.47	\$4.17

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9010
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

- 20% DEVIATION FROM BASE COSTS: \$129.65 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	-----RETURNS PER ACRE-----					
	\$3.74	(\$43.07)	(\$30.44)	\$1.16	\$32.75	\$45.39
	\$4.74	(\$20.18)	(\$4.02)	\$36.38	\$76.78	\$92.94
BASE PRICE =	\$5.75	\$2.71	\$22.39	\$71.60	\$120.80	\$140.48
	\$6.76	\$25.60	\$48.81	\$106.82	\$164.82	\$188.03
	\$7.76	\$48.49	\$75.22	\$142.03	\$208.85	\$235.57

BASE COSTS: \$162.07 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	-----RETURNS PER ACRE-----					
	\$3.74	(\$75.10)	(\$62.57)	(\$31.25)	\$0.06	\$12.59
	\$4.74	(\$52.21)	(\$36.16)	\$3.96	\$44.09	\$60.14
BASE PRICE =	\$5.75	(\$29.32)	(\$9.74)	\$39.18	\$88.11	\$107.68
	\$6.76	(\$6.42)	\$16.67	\$74.40	\$132.13	\$155.23
	\$7.76	\$16.47	\$43.08	\$109.62	\$176.16	\$202.77

+ 20% DEVIATION FROM BASE COSTS: \$194.48 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
-----	-35%	-25%	BASE YIELD	+25%	+35%	
	-----RETURNS PER ACRE-----					
	\$3.74	(\$107.13)	(\$94.71)	(\$63.67)	(\$32.63)	(\$20.21)
	\$4.74	(\$84.23)	(\$68.30)	(\$28.45)	\$11.40	\$27.34
BASE PRICE =	\$5.75	(\$61.34)	(\$41.88)	\$6.77	\$55.42	\$74.88
	\$6.76	(\$38.45)	(\$15.47)	\$41.99	\$99.44	\$122.43
	\$7.76	(\$15.56)	\$10.95	\$77.21	\$143.47	\$169.97

**LIST OF PUBLICATIONS FOR
ESTIMATING 1990 PRODUCTION COSTS**

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

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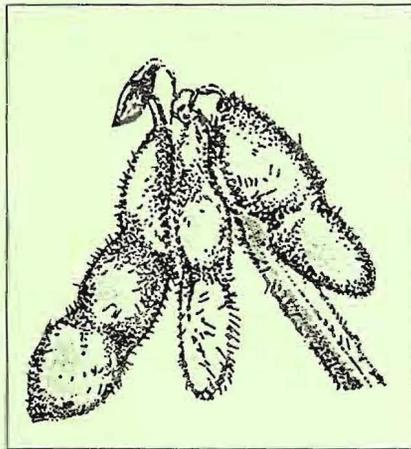
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ESTIMATING 1990 PRODUCTION
COSTS IN ARKANSAS

EXTENSION TECHNICAL BULLETIN NO. 86

SOYBEANS

NO-TILL, FOLLOWING WHEAT,
LOAMY SOILS, FLOOD IRRIGATION



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UNIVERSITY OF ARKANSAS
COOPERATIVE EXTENSION SERVICE
AGRICULTURAL ECONOMICS SECTION

ESTIMATING PRODUCTION COSTS IN ARKANSAS

INTRODUCTION

Estimating Production Costs is an Extension Technical Bulletin prepared by the Agricultural Economics Section within the University of Arkansas Cooperative Extension Service. The authors are Economists specializing in management and finance of the farm business.

The primary purpose of this analysis is to provide a systematic procedure for estimating specified costs associated with producing a defined enterprise. Costs are first developed for each field operation and then aggregated by input item. This publication has seven major parts: A written discussion, page 2; a summary of specified operating and ownership costs, page 3; a sensitivity analysis, page 4; returns above total specified costs at various yield, price, and cost combinations, page 5; a sequential listing of field operations, pages 6 and 7.

SPECIFIED OPERATING AND OWNERSHIP COSTS

Specified operating and ownership costs for this particular enterprise, location, soil type, and irrigation method are located on page 3. The specified operating costs are derived from the sequential listing of operations presented on pages 6 and 7. Breakeven prices for total specified operating costs are given for a base yield and at deviations of 25 and 35 percent.

Total specified ownership costs and breakeven prices for total specified costs are also given on page 3. The depreciation and interest cost components represent an average cost allocated over the entire useful life of the machinery. Various financing arrangements and tax depreciation methods can produce costs that vary significantly from these estimates in a given year. The ability to estimate the actual cost is a complex economic procedure whereby cash accounting and economic costs may vary greatly.

SENSITIVITY ANALYSIS

A sensitivity analysis is presented to provide a broader perspective from which an individual may analyze the specific situation budgeted. Since input prices and quantity may vary, costs are increased and decreased by 20 percent as shown on page 4. A per unit breakeven price is provided for a base yield and at yields of 25 and 35 percent above and below the base yield. These breakeven prices account for changes in costs due to yield differences, such as hauling and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 5 are estimated enterprise returns above total specified costs at various yield, price, and cost combinations. *Not included in these returns are charges for land, risk, overhead labor, other overhead, crop insurance, real estate taxes, and management.*

SEQUENCE OF OPERATIONS

A sequential listing of each operation performed for this enterprise is given on pages 6 and 7. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS EXTENSION SOYBEAN COMMITTEE

Lanny O. Ashlock, Chairman	Ford L. Baldwin
Claude M. Bonner	Jerry Don Clark
Charlie Guy	Gary Huitink
Donald R. Johnson	Edward J. Jordan
Gus M. Lorenz	M.C. McDaniel
H. J. Mascagni	Michael L. May
Roy N. Sharp	Clifford S. Snyder
Phil L. Tacker	Tony E. Windham

THE MENTION OF ANY COMMERCIAL PRODUCT IN THIS ANALYSIS DOES NOT IMPLY ITS ENDORSEMENT BY THE UNITED STATES DEPARTMENT OF AGRICULTURE OR THE UNIVERSITY OF ARKANSAS COOPERATIVE EXTENSION SERVICE OVER OTHER PRODUCTS NOT NAMED, NOR DOES THE OMISSION IMPLY THAT THEY ARE NOT SATISFACTORY.

SPECIFIED OPERATING COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATED COST
SEED	\$12.72	
FERTILIZER	\$14.00	
LIME + APPLICATION	\$7.91	
HERBICIDE	\$36.65	
FUNGICIDE	\$1.95	
INSECTICIDE	\$0.00	
DEFOLIANT	\$0.00	
AERIAL APPLICATION	\$8.00	
MACHINERY:		
FUEL, OIL, LUBRICANTS	\$4.78	
REPAIRS	\$10.71	
LABOR	\$4.31	
IRRIGATION:		
FUEL, OIL, LUBRICANTS	\$8.00	
REPAIRS	\$2.86	
IRRIGATION LABOR	\$5.98	
CUSTOM SPREAD	\$1.25	
CUSTOM HAUL	\$5.25	
CUSTOM DRY OR GINNING	\$0.00	
MISCELLANEOUS	\$1.25	
CROP INSURANCE PREMIUM		
OTHER		
INTEREST ON OP. CAP.	\$6.91	

TOTAL SPECIFIED OPERATING COSTS \$132.53

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OPERATING COST				
YIELD IN BUSHELS				
22.75	26.25	35.00	43.75	47.25
\$5.74	\$5.00	\$3.79	\$3.06	\$2.85

SPECIFIED OWNERSHIP COSTS

RESOURCE OR INPUT	PER ACRE COST	YOUR ESTIMATE
TRACTORS:		
DEPRECIATION	\$2.73	
INTEREST	\$2.25	
EQUIPMENT:		
DEPRECIATION	\$3.07	
INTEREST	\$1.68	
SPECIAL EQUIPMENT:		
DEPRECIATION	\$10.93	
INTEREST	\$4.00	
MISCELLANEOUS:		
DEPRECIATION	\$0.00	
INTEREST	\$0.00	
IRRIGATION:		
DEPRECIATION	\$8.16	
INTEREST	\$7.62	
TAXES & INSURANCE	\$3.53	
INTEREST	\$0.39	
OVERHEAD LABOR		
OTHER OVERHEAD		
LAND & PROPERTY TAX		
MANAGEMENT		

TOTAL SPECIFIED OWNERSHIP COSTS \$44.37

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$176.89

PER UNIT BREAKEVEN PRICE, TOTAL SPECIFIED OWNERSHIP & OPERATING COST				
YIELD IN BUSHELS				
22.75	26.25	35.00	43.75	47.25
\$7.69	\$6.69	\$5.05	\$4.07	\$3.78

NOT INCLUDED IN THIS REPORT ARE CHARGES FOR LAND, RISK, OVERHEAD LABOR, OTHER OVERHEAD, CROP INSURANCE, REAL ESTATE TAXES, AND MGT.

SENSITIVITY ANALYSIS:

EFFECTS OF A 20% VARIATION IN SPECIFIED INPUT COSTS ON
PER UNIT BREAKEVEN PRICES.

ENTERPRISE: SOYBEANS, NO-TILL, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9011
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

RESOURCE OR INPUT	-20% DEVIATION	BASE COST PAGE 3	+20% DEVIATION
(A)	(B)	(D)	(F)
HERBICIDE	\$29.32	\$36.65	\$43.98
DEPRECIATION	\$19.92	\$24.89	\$29.87
OWNERSHIP INTEREST	\$12.75	\$15.94	\$19.13
FERTILIZER	\$11.20	\$14.00	\$16.80
REPAIRS	\$10.85	\$13.57	\$16.28
SEED	\$10.18	\$12.72	\$15.26
HIRED LABOR	\$8.23	\$10.29	\$12.35
AERIAL APPLI. (CUSTOM HIRE)	\$6.40	\$8.00	\$9.60
IRRIGATION FUEL & OIL	\$6.40	\$8.00	\$9.60
LIME + APPLICATION	\$6.33	\$7.91	\$9.49
INTEREST ON OP. CAP.	\$5.53	\$6.91	\$8.29
HAUL (CUSTOM HIRE)	\$4.20	\$5.25	\$6.30
MACHINERY FUEL & OIL	\$3.83	\$4.78	\$5.74
FARM TAXES	\$2.26	\$2.83	\$3.39
FUNGICIDE	\$1.56	\$1.95	\$2.34
MISCELLANEOUS	\$1.00	\$1.25	\$1.50
SPREAD (CUSTOM HIRE)	\$1.00	\$1.25	\$1.50
FARM INSURANCE	\$0.57	\$0.71	\$0.85
CROP INSURANCE PREM.			
CROP MKT. & COM. STORAGE			
DEFOLIANT			
DRY OR GINNING (COMMERCIAL)			
DRYING FUEL			
FINANCIAL SERVICES			
INSECTICIDE			
LAND CHARGE			
LEASE PAYMENTS			
MACHINE HIRE			
MANAGEMENT			
OVERHEAD			
UTILITIES			

TOTAL SPECIFIED COST/ACRE	\$141.52	\$176.89	\$212.27
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PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS		BREAKEVEN PRICE		
	YIELD			
-35% OF BASE YIELD	22.75	\$6.15	\$7.69	\$9.23
-25% OF BASE YIELD	26.25	\$5.35	\$6.69	\$8.02
BASE YIELD	35.00	\$4.04	\$5.05	\$6.06
+25% OF BASE YIELD	43.75	\$3.26	\$4.07	\$4.89
+35% OF BASE YIELD	47.25	\$3.03	\$3.78	\$4.54

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: SOYBEANS, NO-TILL, FOLLOWING WHEAT, 1990
 ENTERPRISE FILE NO.: SOY9011
 LOCATION: ARKANSAS
 SOILS TYPE: LOAMY
 IRRIGATION METHOD: FLOOD

- 20% DEVIATION FROM BASE COSTS: \$141.52 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$54.94)	(\$42.30)	(\$10.70)	\$20.89	\$33.53
	\$4.74	(\$32.04)	(\$15.88)	\$24.52	\$64.92	\$81.08
BASE PRICE =	\$5.75	(\$9.15)	\$10.53	\$59.73	\$108.94	\$128.62
	\$6.76	\$13.74	\$36.94	\$94.95	\$152.96	\$176.17
	\$7.76	\$36.63	\$63.36	\$130.17	\$196.99	\$223.71

BASE COSTS: \$176.89 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$89.93)	(\$77.40)	(\$46.08)	(\$14.76)	(\$2.24)
	\$4.74	(\$67.04)	(\$50.99)	(\$10.86)	\$29.26	\$45.31
BASE PRICE =	\$5.75	(\$44.14)	(\$24.57)	\$24.36	\$73.28	\$92.85
	\$6.76	(\$21.25)	\$1.84	\$59.57	\$117.31	\$140.40
	\$7.76	\$1.64	\$28.26	\$94.79	\$161.33	\$187.94

+ 20% DEVIATION FROM BASE COSTS: \$212.27 PER ACRE

PRODUCER PRICE ESTIMATES	YIELD IN BUSHELS					
	22.75	26.25	35.00	43.75	47.25	
	-35%	-25%	BASE YIELD	+25%	+35%	
	- - - - - RETURNS PER ACRE - - - - -					
	\$3.74	(\$124.92)	(\$112.50)	(\$81.46)	(\$50.42)	(\$38.00)
	\$4.74	(\$102.03)	(\$86.09)	(\$46.24)	(\$6.40)	\$9.54
BASE PRICE =	\$5.75	(\$79.13)	(\$59.67)	(\$11.02)	\$37.63	\$57.09
	\$6.76	(\$56.24)	(\$33.26)	\$24.19	\$81.65	\$104.63
	\$7.76	(\$33.35)	(\$6.85)	\$59.41	\$125.67	\$152.18

**LIST OF PUBLICATIONS FOR
ESTIMATING 1990 PRODUCTION COSTS**

<u>ECONOMIC SUMMARY</u>	<u>ETB</u>	<u>DESCRIPTION</u>
AG-2-10-89	ETB 71	Oats, Loamy Soils, Arkansas
AG-3-10-89	ETB 72	Wheat, Loamy Soils, Arkansas
AG-4-10-89	ETB 73	Wheat, Clay Soils, Arkansas
AG-5-10-89	ETB 75	Rapeseed (Canola), Loamy Soils, Arkansas
AG-6-10-89	ETB 76	Soybeans, Loamy Soils, Arkansas
AG-7-10-89	ETB 77	Soybeans, Loamy Soils, Furrow Irrigation, Arkansas
AG-8-10-89	ETB 78	Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas
AG-9-10-89	ETB 79	Soybeans, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-10-10-89	ETB 80	Soybeans, Drilled, Loamy Soils, Arkansas
AG-11-10-89	ETB 81	Soybeans, Following Wheat, Loamy Soils, Arkansas
AG-12-10-89	ETB 82	Soybeans, Following Wheat, Loamy Soils, Center Pivot Irrigation, Towable, 260 Acres, Arkansas
AG-13-10-89	ETB 83	Soybeans, Clay Soils, Arkansas
AG-14-10-89	ETB 84	Soybeans, Clay Soils, Center Pivot Irrigation, Non-Towable, 130 Acres, Arkansas
AG-15-10-89	ETB 85	Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-16-10-89	ETB 86	Soybeans, No-Till, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas
AG-17-10-89	ETB 87	Rice, Long Grain, Midseason Variety (Newbonnet), Silt Loam Soils, Eastern Arkansas
AG-18-10-89	ETB 88	Rice, Long Grain, Very Short Season Variety (Tebonnet), Silt Loam Soils, Eastern Arkansas
AG-19-10-89	ETB 89	Rice, Long Grain, Semi-dwarf Variety (Lemont), Silt Loam Soils, Eastern Arkansas
AG-20-10-89	ETB 90	Rice, Medium Grain, Short Season Variety (Mars), Silt Loam Soils, Eastern Arkansas
AG-21-10-89	ETB 91	Rice, Long Grain, Midseason Variety (Newbonnet), Clay Soils, Eastern Arkansas
AG-22-10-89	ETB 92	Rice, Long Grain, Midseason Variety (Newbonnet), Grand Prairie Soils, Grand Prairie Region, Arkansas
AG-23-10-89	ETB 93	Cotton, Loamy Soils, Solid Planted, South of I-40, Eastern Arkansas
AG-24-10-89	ETB 94	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-25-10-89	ETB 95	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-26-10-89	ETB 96	Cotton, Loamy Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-27-10-89	ETB 97	Cotton, Clay Soils, Solid Planted, North of I-40, Eastern Arkansas
AG-28-10-89	ETB 98	Cotton, Loamy Soils, Solid Planted, Furrow Irrigation, North of I-40, Eastern Arkansas
AG-29-10-89	ETB 99	Cotton, Loamy Soils, Solid Planted, Center Pivot Irrigation, 130 Acres, North of I-40, Eastern Arkansas
AG-30-10-89	ETB 100	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Furrow Irrigation, South of I-40, Eastern Arkansas
AG-31-10-89	ETB 101	Cotton, Loamy Soils, Narrow 2x1 Skip Row, Center Pivot Irrigation, 130 Acres, South of I-40, Eastern Arkansas
AG-32-10-89	ETB 102	Corn, Loamy Soils, Flood Irrigation, Arkansas
AG-33-10-89	ETB 103	Corn, Loamy Soils, Furrow Irrigation, Arkansas
AG-34-10-89	ETB 104	Grain Sorghum, Loamy Soils, Arkansas
AG-35-10-89	ETB 105	Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas
AG-36-10-89	ETB 106	Grain Sorghum, Clay Soils, Arkansas
AG-37-10-89	ETB 107	Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas

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