

**ESTIMATING 1989 PRODUCTION
COSTS IN ARKANSAS**

EXTENSION TECHNICAL BULLETIN NO. 38

WHEAT

CLAY SOILS



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ESTIMATING 1989 PRODUCTION COSTS

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 1; a summary of specified operating and ownership costs, page 2; a sensitivity analysis, page 3; returns above total specified costs at various yield, price, and cost combinations, page 4; a sequential listing of field operations, pages 5 and 6; and a list of all publications for estimating enterprise production costs for 1989 crops, page 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 2. The specified operating costs are derived from the sequential listing of operations presented on pages 5 and 6. 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 2. 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 3. 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 ginning and drying.

RETURNS ABOVE TOTAL SPECIFIED COSTS

Presented on page 4 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 5 and 6. These operations provide the foundation on which the economic analysis is based. Note the specified costs associated with each field operation.

ACKNOWLEDGEMENTS

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Donald Adams, Extension Agronomist - Feed Grains

Stanley L. Chapman, Extension Soils Specialist

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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 | ESTIMATED COST |
|------------------------|---------------|----------------|
| SEED | \$9.00 | |
| FERTILIZER | \$21.47 | |
| LIME + APPLICATION | \$0.00 | |
| HERBICIDE | \$0.00 | |
| FUNGICIDE | \$0.00 | |
| INSECTICIDE | \$0.00 | |
| DEFOLIANT | \$0.00 | |
| AERIAL APPLICATION | \$3.15 | |
| MACHINERY: | | |
| FUEL, OIL, LUBRICANTS | \$5.27 | |
| REPAIRS | \$9.42 | |
| LABOR | \$4.84 | |
| IRRIGATION: | | |
| FUEL, OIL, LUBRICANTS | \$0.00 | |
| REPAIRS | \$0.00 | |
| IRRIGATION LABOR | \$0.00 | |
| 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. | \$3.25 | |

TOTAL SPECIFIED OPERATING COSTS \$62.40

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

| | 26.00 | 30.00 | 40.00 | 50.00 | 54.00 |
|--|--------|--------|--------|--------|--------|
| | \$2.31 | \$2.03 | \$1.56 | \$1.28 | \$1.20 |

SPECIFIED OWNERSHIP COSTS

| RESOURCE OR INPUT | PER ACRE COST | YOUR ESTIMATE |
|---------------------|---------------|---------------|
| TRACTORS: | | |
| DEPRECIATION | \$3.33 | |
| INTEREST | \$2.75 | |
| EQUIPMENT: | | |
| DEPRECIATION | \$2.79 | |
| INTEREST | \$1.68 | |
| SPECIAL EQUIPMENT: | | |
| DEPRECIATION | \$7.69 | |
| INTEREST | \$2.82 | |
| MISCELLANEOUS: | | |
| DEPRECIATION | \$0.00 | |
| INTEREST | \$0.00 | |
| IRRIGATION: | | |
| DEPRECIATION | \$0.00 | |
| INTEREST | \$0.00 | |
| TAXES & INSURANCE | \$1.65 | |
| INTEREST | \$0.18 | |
| OVERHEAD LABOR | | |
| OTHER OVERHEAD | | |
| LAND & PROPERTY TAX | | |
| MANAGEMENT | | |

TOTAL SPECIFIED OWNERSHIP COSTS \$22.89

TOTAL SPECIFIED OPERATING AND OWNERSHIP COSTS \$85.29

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

| | 26.00 | 30.00 | 40.00 | 50.00 | 54.00 |
|--|--------|--------|--------|--------|--------|
| | \$3.20 | \$2.79 | \$2.13 | \$1.74 | \$1.62 |

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: WHEAT, 1988-89
 ENTERPRISE FILE NO.: WT8902
 LOCATION: ARKANSAS
 SOILS TYPE: CLAY
 IRRIGATION METHOD: NONE

| RESOURCE OR INPUT | -20% DEVIATION | BASE COST PAGE 2 | +20% DEVIATION |
|-----------------------------|-------------------|------------------------|-------------------|
| (A) | (B) | (D) | (F) |
| FERTILIZER | \$17.17 | \$21.47 | \$25.76 |
| DEPRECIATION | \$11.05 | \$13.81 | \$16.57 |
| REPAIRS | \$7.54 | \$9.42 | \$11.31 |
| SEED | \$7.20 | \$9.00 | \$10.80 |
| OWNERSHIP INTEREST | \$5.95 | \$7.43 | \$8.92 |
| HAUL (CUSTOM HIRE) | \$4.80 | \$6.00 | \$7.20 |
| MACHINERY FUEL & OIL | \$4.21 | \$5.27 | \$6.32 |
| HIRED LABOR | \$3.87 | \$4.84 | \$5.80 |
| INTEREST ON OP. CAP. | \$2.60 | \$3.25 | \$3.90 |
| AERIAL APPLI. (CUSTOM HIRE) | \$2.52 | \$3.15 | \$3.78 |
| FARM TAXES | \$1.05 | \$1.32 | \$1.58 |
| FARM INSURANCE | \$0.26 | \$0.33 | \$0.40 |
| CROP INSURANCE PREM. | | | |
| CROP MKT. & COM. STORAGE | | | |
| DEFOLIANT | | | |
| DRY OR GINNING (COMMERCIAL) | | | |
| DRYING FUEL | | | |
| FINANCIAL SERVICES | | | |
| FUNGICIDE | | | |
| HERBICIDE | | | |
| INSECTICIDE | | | |
| IRRIGATION FUEL & OIL | | | |
| LAND CHARGE | | | |
| LEASE PAYMENTS | | | |
| LIME + APPLICATION | | | |
| MACHINE HIRE | | | |
| MANAGEMENT | | | |
| MISCELLANEOUS | | | |
| OVERHEAD | | | |
| SPREAD (CUSTOM HIRE) | | | |
| UTILITIES | | | |

TOTAL SPECIFIED COST/ACRE \$68.23 \$85.29 \$102.35

PER UNIT BREAKEVEN PRICE--TOTAL SPECIFIED COSTS

| | YIELD | BREAKEVEN PRICE | | |
|--------------------|-------|-----------------|--------|--------|
| -35% OF BASE YIELD | 26.00 | \$2.56 | \$3.20 | \$3.83 |
| -25% OF BASE YIELD | 30.00 | \$2.23 | \$2.79 | \$3.35 |
| BASE YIELD | 40.00 | \$1.71 | \$2.13 | \$2.56 |
| +25% OF BASE YIELD | 50.00 | \$1.39 | \$1.74 | \$2.08 |
| +35% OF BASE YIELD | 54.00 | \$1.30 | \$1.62 | \$1.94 |

ESTIMATED ENTERPRISE RETURNS ABOVE TOTAL SPECIFIED COSTS

ENTERPRISE: WHEAT, 1988-89
 ENTERPRISE FILE NO.: WT8902
 LOCATION: ARKANSAS
 SOILS TYPE: CLAY
 IRRIGATION METHOD: NONE

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- 20% DEVIATION FROM BASE COSTS: \$68.23 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----- | | | | | |
| | \$2.11 | (\$11.60) | (\$3.67) | \$16.17 | \$36.00 | \$43.94 |
| | \$2.68 | \$3.22 | \$13.43 | \$38.97 | \$64.50 | \$74.72 |
| BASE PRICE = | \$3.25 | \$18.04 | \$30.53 | \$61.77 | \$93.00 | \$105.50 |
| | \$3.82 | \$32.86 | \$47.63 | \$84.57 | \$121.50 | \$136.28 |
| | \$4.39 | \$47.68 | \$64.73 | \$107.37 | \$150.00 | \$167.06 |

BASE COSTS: \$85.29 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----- | | | | | |
| | \$2.11 | (\$28.21) | (\$20.41) | (\$0.89) | \$18.63 | \$26.44 |
| | \$2.68 | (\$13.39) | (\$3.31) | \$21.91 | \$47.13 | \$57.22 |
| BASE PRICE = | \$3.25 | \$1.43 | \$13.79 | \$44.71 | \$75.63 | \$88.00 |
| | \$3.82 | \$16.25 | \$30.89 | \$67.51 | \$104.13 | \$118.78 |
| | \$4.39 | \$31.07 | \$47.99 | \$90.31 | \$132.63 | \$149.56 |

+ 20% DEVIATION FROM BASE COSTS: \$102.35 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----- | | | | | |
| | \$2.11 | (\$44.83) | (\$37.15) | (\$17.95) | \$1.25 | \$8.93 |
| | \$2.68 | (\$30.01) | (\$20.05) | \$4.85 | \$29.75 | \$39.71 |
| BASE PRICE = | \$3.25 | (\$15.19) | (\$2.95) | \$27.65 | \$58.25 | \$70.49 |
| | \$3.82 | (\$0.37) | \$14.15 | \$50.45 | \$86.75 | \$101.27 |
| | \$4.39 | \$14.45 | \$31.25 | \$73.25 | \$115.25 | \$132.05 |

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**LIST OF PUBLICATIONS FOR
ESTIMATING PRODUCTION COSTS**

- ETB 36 Estimating Farm Machinery Costs in Arkansas, May 1988
- ETB 37 Wheat, Loamy Soils, Arkansas, 1989
- ETB 38 Wheat, Clay Soils, Arkansas, 1989
- ETB 39 Oats, Loamy Soils, Arkansas, 1989
- Extension Technical Bulletins 40 - 68 will be available December 15, 1988.
- ETB 40 Soybeans, Loamy Soils, Arkansas, 1989
- ETB 41 Soybeans, Loamy Soils, Furrow, Irrigation Arkansas, 1989
- ETB 42 Soybeans, In Rice Rotation, Loamy Soils, Flood Irrigation, Arkansas, 1989
- ETB 43 Soybeans, Loamy Soils, Center Pivot, Towable, 260 Acres, Arkansas, 1989
- ETB 44 Soybeans, Drilled, Loamy Soils, Arkansas, 1989
- ETB 45 Soybeans, Following Wheat, Loamy Soils, Arkansas, 1989
- ETB 46 Soybeans, Following Wheat, Loamy Soils, Center Pivot, Towable, 260 Acres, Arkansas, 1989
- ETB 47 Soybeans, Clay Soils, Arkansas, 1989
- ETB 48 Soybeans, Clay Soils, Center Pivot, Non-Towable, 1989
- ETB 49 Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas, 1989
- ETB 50 No-Till Soybeans, Following Wheat, Loamy Soils, Flood Irrigation, Arkansas, 1989
- ETB 51 Rice, Silt Loam Soils, Eastern Arkansas, 1989
- ETB 52 Rice, Clay Soils, Eastern Arkansas, 1989
- ETB 53 Rice, Grand Prairie Soils, Grand Prairie Region, Arkansas, 1989
- ETB 54 Cotton, Loamy Soils, Eastern Arkansas, South of I-40, 1989
- ETB 55 Cotton, Loamy Soils, Furrow Irrigation, Eastern Arkansas, South of I-40, 1989
- ETB 56 Cotton, Loamy Soils, Center Pivot, 130 Acres, Eastern Arkansas, South of I-40, 1989
- ETB 57 Cotton, Loamy Soils, Eastern Arkansas, North of I-40, 1989
- ETB 58 Cotton, Clay Soils, Eastern Arkansas, North of I-40, 1989
- ETB 59 Cotton, Loamy Soils, Furrow Irrigation, Eastern Arkansas, North of I-40, 1989
- ETB 60 Cotton, Loamy Soils, Center Pivot, 130 Acres, Eastern Arkansas, North of I-40, 1989
- ETB 61 Cotton, Loamy Soils, 2-1 Narrow Skip Row, Furrow Irrigation, Eastern Arkansas, South of I-40, 1989
- ETB 62 Cotton, Loamy Soils, 2-1 Narrow Skip Row, Center Pivot 130 Acres, Eastern Arkansas, South of I-40, 1989
- ETB 63 Corn, Loamy Soils, Flood Irrigation, Arkansas, 1989
- ETB 64 Corn, Loamy Soils, Furrow Irrigation, Arkansas, 1989
- ETB 65 Grain Sorghum, Loamy Soils, Arkansas, 1989
- ETB 66 Grain Sorghum, Loamy Soils, Flood Irrigation, Arkansas, 1989
- ETB 67 Grain Sorghum, Clay Soils, Arkansas, 1989
- ETB 68 Grain Sorghum, Clay Soils, Flood Irrigation, Arkansas, 1989