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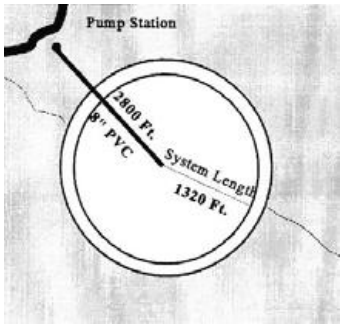
# 60 Acre Pivot Irrigation Cost Analysis




## General Description

This publication attempts to evaluate a typical irrigation system in terms of initial and annual cost and its adaptability to Alabama conditions for farm irrigation. The cost per acre to purchase, install and operate an irrigation system will depend on the design requirements for each individual unit ***and is particularly sensitive to petroleum costs for fuel and manufacture of polyvinyl chloride (PVC) pipe***. Where two irrigation sites have similar characteristics, (water source, land clearing requirements, field size, shape, elevation, etc.) the component requirements and cost analysis of one site may be used to get an idea of the requirements for the second site. While the design illustrated above is not necessarily a recommended layout, it is one example. Each farm irrigation site must be evaluated on an individual basis to determine the exact design and component requirements and to develop a cost analysis for that particular location.

The example system utilizes surface water. For farm irrigation, this is a stream, creek or pond. In areas where wells are practical, well cost should be determined. Whether to go with a well or surface water development or a combination of these will vary with local conditions and must be evaluated on a case-by-case basis.

For the example system discussed here, typical initial costs for each component are indicated and annual per acre ownership and operating costs are estimated. Annual costs are calculated over the useful life of the equipment. Available tax credits and/or other tax advantages or federal or state cost share for system efficiency improvements are not figured in this example, but would reduce ownership costs when available. Also, remember that the loan repayment period for purchasing irrigation equipment is usually much shorter than the useful life used for calculating ownership cost. Where this is true, annual ownership cost may underestimate actual cash flow needed to meet loan obligations during the repayment period. Another alternative to direct purchase of irrigation equipment is equipment leasing. This may be desirable in some cash flow situations.

The system described here uses an electric power source. This could be three phase power, where available, or single phase-powered phase convertors, depending on the electrical system serving the

location. Call your electric supplier for availability of electric power to the site. In some cases there may be additional line extension charges for service or additional monthly billing charges based on motor horsepower (generally above 50 hp). Discuss these details with your electric power supplier as you begin planning.

## DESCRIPTION: 60 Acre Center Pivot

The 60-acre stationary center pivot system described here is considered a typical size unit in Alabama. When the pivot point is located at the center of a 68 acre block of land, this system will irrigate approximately 60 acres. (In order to irrigate 60 acres, an end gun must be used to extend coverage beyond the pivot pipe.

A breakdown of component costs is shown below for the irrigation system illustrated on page 1. Annual per acre ownership and operating costs are also calculated.

### COST ANALYSIS OF IRRIGATION SYSTEM

CENTER PIVOT SYSTEM

| 60 Acre Coverage<br>1 Pivot Point | Initial Cost | Years Useful Life | Yearly Depreciation |
|---|---|---|---|
| A. Basic System – Investment Cost | | | |
| 1. System - Electric Drive | $ 35,154 | 20 | $1,758 |
| Length – 837 feet plus | | | |
| end gun coverage = 100 feet | | | |
| | | | |
| Systems Options (including): | | | |
| End Gun & Automatic End Gun Control | | | |
| Running Lights – Automatic Stop - | | | |
| Booster Pump – Sprinkler Package - | | | |
| Low Pressure Shut-off | | | |
| | | | |
| 2. Freight, Installation | $10,000 | 20 | 500 |
| | | | |
| 3. Power Unit and Pump | $ 4,439 | 20 | 222 |
| 15 Horsepower 3PH Electric Motor | | | |
| “Across-the-line” Starter | | | |
| Centrifugal Pump 450 GPM @ 107’ TDH | | | |
| | | | |
| 4. Generator for Pivot (NOT REQUIRED) | | | |
| 1200’ feet, PIVOT power and safety wire | $ 6,000 | 15 | 400 |
| | | | |
| 5. PVC Pipe (Installed) - | $ 9,720 | 20 | 486 |
| 6 inch x 1200 feet @ $8.10 per foot | | | |
| | | | |
| 6. Pipe Valves, Fittings, Concrete | $ 4,888 | 20 | 244 |
| | | | |
| 7. Miscellaneous | $ 3,204 | --- | --- |
| | | | |
| TOTAL COST | $73,405 | | 3610 |
| TOTAL COST PER ACRE | $ 1,223 | | 60 |

| B. Annual Ownership Cost | Yearly Totals |
|---|---|
| 1. Yearly Depreciation | $ 3,610 |
| 2. Interest on Average Investment ( 9 % ) | $ 3,295 |
| 3. Insurance on Average Investment (0.7 %) | $ 256 |
| TOTAL ANNUAL OWNERSHIP COST | $ 7,161 |
| TOTAL ANNUAL OWNERSHIP COST PER ACRE | $ 119.35 |
| | |
| C. Annual Operating Cost Per Acre-Inch (A-I) of Water Applied | |
| 1. Electricity @ $0.10 per KWH – 861 KWH to apply 1 NET A-I | $ 1.44 |
| 2. Bearing Lubrication ( 15 % of fuel/power cost) | $ 0.22 |
| 3. Repairs – Power Unit (% initial cost – electric 0.06%, diesel 0.17%) | $ 0.04 |
| 4. Repairs – Irrigation Unit ( 0.16% system initial cost) | $ 0.93 |
| 5. Labor ($ 8.00 per hour) | $ 0.10 |
| TOTAL OPERATING COST PER ACRE-INCH | $ 2.73 |
| ANNUAL OPERATING COST FOR YEAR REQUIRING **7** ACRE-INCHS OF WATER | $ 1,145.34 |
| | |
| D. Annual TOTAL COSTS for Owning and Operating this Irrigation during a Year Requiring 7 Acre-Inches of Water | |
| TOTAL ANNUAL COST FOR SYSTEM | $ 8,306.34 |
| TOTAL ANNUAL COST PER IRRIGATED ACRE | $ 138.44 |

Thus, additional yield worth at least $138.44 per acre would be required to cover the ownership and operating cost for this system. Additional production costs from higher fertilizer rates, additional seed, increased harvesting and drying costs, etc., incurred due to intensified irrigation would also have to be covered in order to offset all additional expenses.

## Prepared by

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