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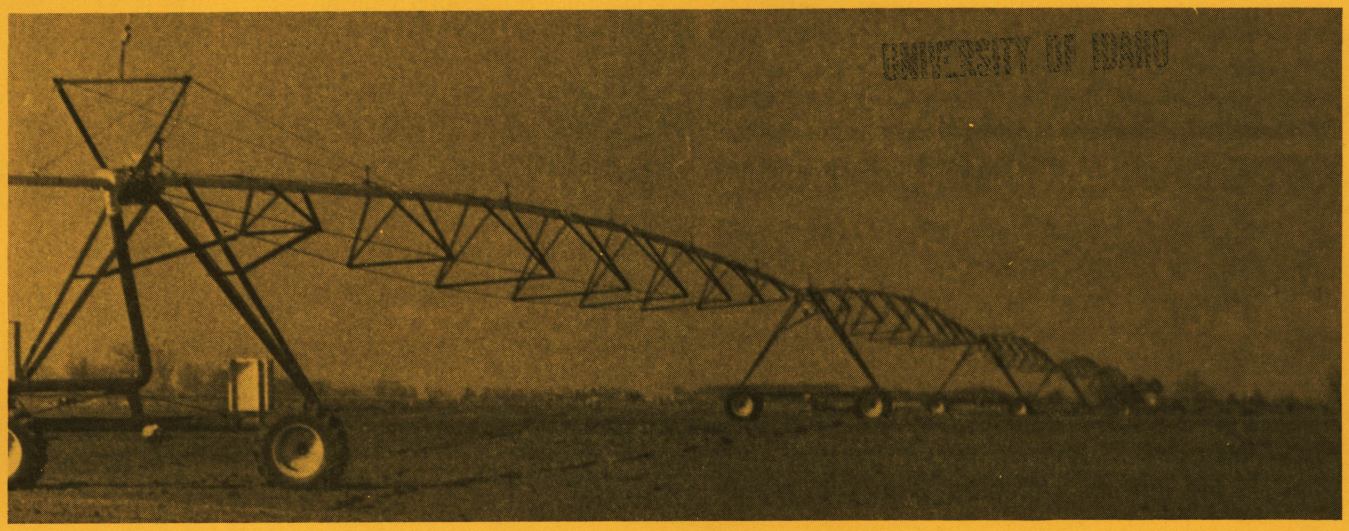

Investment Costs For Center Pivot Systems

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The purchase of an irrigation system is a big investment — an investment you should consider carefully before making the commitment. Many farmers in Idaho have purchased sprinkler systems to reduce labor costs, make better use of available water or to irrigate fields where surface methods are not practical. In certain areas, gravity sprinkler systems are ideal. For many growers, though, the high cost of energy and capital, along with advances in technology, have changed the feasibility of investing in a system.

This publication should serve as a guide if you are considering investing in an irrigation system. The figures are based on example situations. To tailor these figures more closely to your situation, make adjustments to the various cost figures where data are available.

The cost figures are current as of Janury 1980 and include:

- **System investment** — the purchase and installation cost of the complete system. Center pivot irrigation systems are presently eligible for investment tax credit and accelerated depreciation. These tax advantages in the year purchased should make the investment more favorable.

- **Per acre variable costs** — the annual cash expenses of operating the system. These costs include a district water fee, labor, repair and maintenance of the system and electrical costs for drawing the water from the ditch or reservoir and pumping it at approximately 55 psi through the sprinkler system. Water is purchased from an irrigation district at $4.50 per acre.

- **Per acre fixed costs** — charges that would be incurred regardless of whether the system is used. Fixed costs include annual depreciation, interest on investment, personal property taxes and insurance fees.

Add the variable and fixed costs. The total is the annual cost for owning and operating the system.

Assumptions Concerning The Center Pivot System

Land and Water

Two pivot systems are analyzed here. The example field of 160 acres is irrigated by a typical pivot system which covers 130 acres and by a corner system which irrigates 154 acres. Although a water fee of $4.50 per acre is used here, the amount may vary by water district. In most areas payment of the water fee is necessary to maintain water rights whether or not the water is actually used. In the variable cost section of Table 1, the water fee is charged only to irrigated acres, raising the effective cost slightly. This water charge, along with the other variable costs, is shown on a per irrigated acre basis. The additional investment required to include the corners is $14,575.00 or $607.29 per additional irrigated acre. Marginal variable cost to irrigate the corners is $1.79 per acre.

Mainline and Laterals

Mainline used for both systems consists of 1,320 feet of 10-inch steel pipe. Both pivots also have 1,320-foot laterals. The 130-acre system uses an end gun while the 154-acre system includes an automatic arm to irrigate the corners. The systems are pressurized by 75- and 100-horsepower pumps respectively. An average of 25.71 inches of water applied is assumed based on a crop rotation sequence of 1 year of spring wheat, 3 years of alfalfa hay, 2 years of beans and 1 year of sugarbeets.

Labor

Labor requirements are figured on 0.5 hours per rotation for the 130-acre system and 0.6 hours per rotation for the 154-acre system. Maintenance in the off-season is estimated at 40 hours for each system. Seasonal labor requirements are 79 and 86.2 hours for the respective systems.

Table 1. Irrigation costs for center pivot sprinkler system on 130 acres.

System investment	Pivot only	Pivot w/corner gun
Mainline	$ 7,590.00	$ 7,590.00
Lateral	32,500.00	46,000.00
Pump, motor, electrical, etc.	9,555.00	10,630.00
Reservoir	481.00	481.00
Total investment	$ 50,126.00	$ 64,701.00
Investment per acre	385.58	420.14
Per acre variable costs		
Maintenance (2½% of investment)	$ 9.64	$ 10.50
Power @ 0.0217/KWhr[2]	15.91 (95,160 KWhr)	17.83 (125,972 KWhr)
District water fee[3]	5.54	4.67
Labor @ $3.75/hr	2.28 (0.61 hr)	2.10 (0.58 hr)
Interest on operating capital (6 mo at 12% APR)	1.64	1.70
Total variable cost per acre	$ 35.01	$ 36.80
Per acre fixed costs		
Depreciation (straight-line) and interest (12%)	$ 54.67	$ 59.71
Taxes and insurance	6.49	7.07
Total fixed cost per acre	$ 61.16	$ 66.78
Total fixed and variable costs per acre	**$ 96.17**	**$ 103.58**

[1]Powell, T. A., B. L. Calkins and K. H. Lindeborg. 1980. Irrigation costs for southern Idaho. Univ. of Idaho Progress Report 213.

[2]Idaho Power Company. 1980. Irrigation and soil drainage pumping service, schedule 24.

[3]District water fee of $4.50 per acre adjusted to irrigated acres in field.

Geographic, soil and other local factors may modify these cost figures.

Further References

You may obtain expanded descriptions of these and other irrigation systems in University of Idaho Progress Report No. 213, *Irrigation Costs for Southern Idaho*, May 1980, by T. A. Powell, B. L. Calkins and K. H. Lindeborg.

Other recent Idaho publications on costs of irrigation systems available from county offices of the University of Idaho Cooperative Extension Service are:

CIS 577 Investment Costs for Sprinkler Systems ..... 10 cents

CIS 578 Investment Costs for Gravity Irrigation Systems ..... 10 cents

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