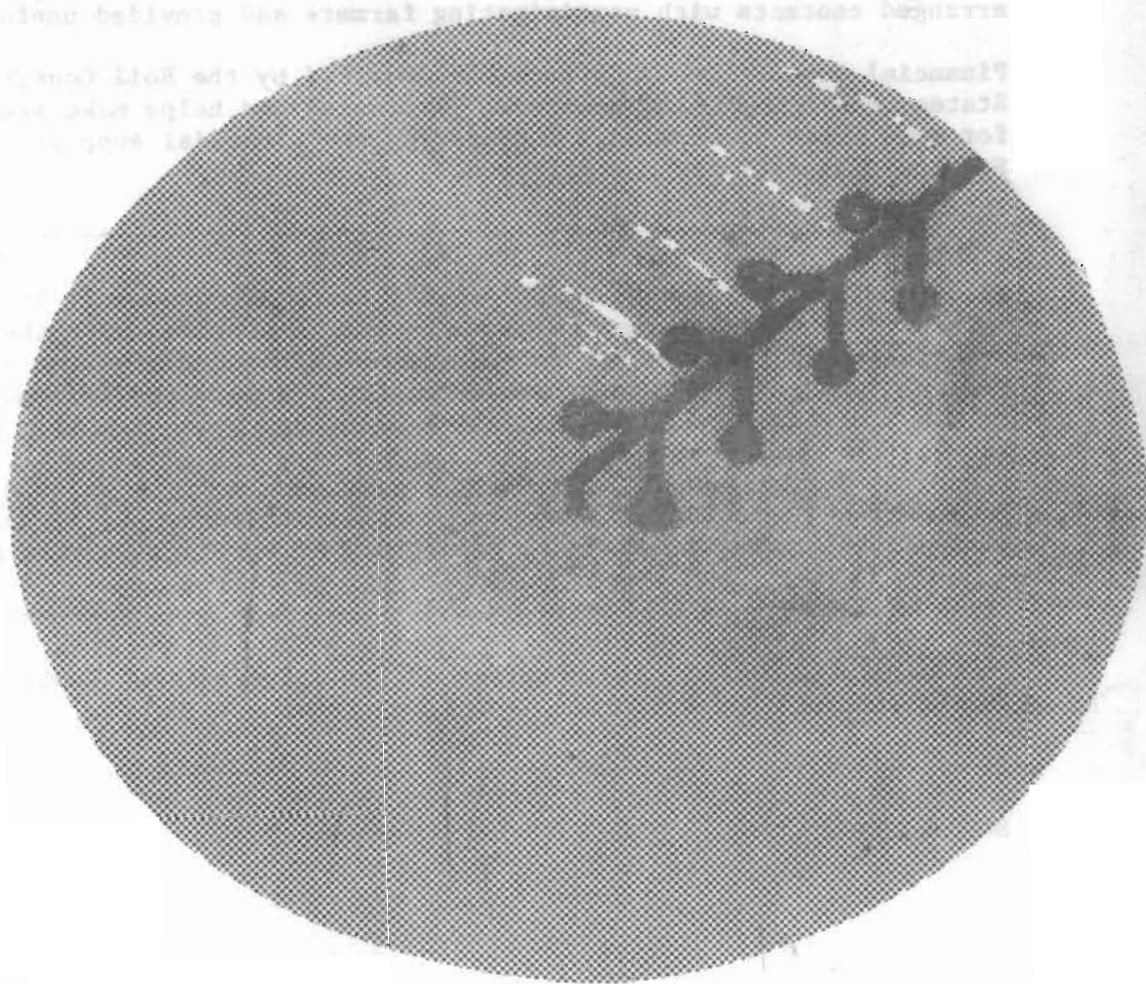


COSTS OF PRODUCING CROPS CENTER PIVOT IRRIGATION SOUTHEASTERN WYOMING, 1977-1978

BULLETIN B670, MARCH 1978

**SUGARBEETS
CORN FOR GRAIN
CORN FOR SILAGE
DRY BEANS
ALFALFA , BALED
ALFALFA , CUBED
BARLEY FOR FEED
IRRIGATED PASTURE
POTATOES**



**AGRICULTURAL EXTENSION SERVICE
DIVISION OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WYOMING, LARAMIE**

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COSTS OF PRODUCING CROPS,
CENTER PIVOT SPRINKLER IRRIGATION,
SOUTHEASTERN, WYOMING, 1977-78

by D. E. Agee*

INTRODUCTION

This report was prepared to accompany and supplement information contained in a companion study, "Costs of Producing Crops, Torrington-Wheatland Area, Wyo., 1977-78."^{a/}

Many farms in southeastern Wyoming have surface or furrow-flood irrigation systems. Other farms have only sprinkler irrigation or both furrow and sprinkler systems.

The predominant type of sprinkler irrigation in southeastern Wyoming is the circle or center pivot system. Sideroll and hand move systems are used to a lesser degree.

Irrigation water for sprinkler systems comes from different sources. Some systems use water pumped from irrigation district canals similar to that used on most furrow irrigated farms, but most sprinkler systems use water pumped from wells.

Irrigation wells in southeastern Wyoming vary widely in depth and volume or yield of water. For example, static water levels in area wells may vary from just a few feet to 300 ft. or more. Yield in gallons/minute may vary from 200 gpm or less up to 2,000 gpm or more.

Since about 1960 farmers and ranchers in southeastern Wyoming have installed several hundred center pivot sprinkler systems. These sprinklers, in general, have been installed on lands formerly in native grass, or dry land crops. Only a limited number of circles have been installed on lands formerly irrigated by surface systems. Sprinklers can be used on rolling lands which may be difficult to furrow irrigate.

Center pivot systems vary in size. The most common is the 1/4 section sprinkler that

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^{a/} Costs of Producing Crops, Torrington-Wheatland Area, Wyo., 1977-78, Agric. Ext. Ser., Div. of Agric. Econ., Univ. of Wyo., Bull. 665, May 1978.

effectively irrigates a circle of about 125 to 135 acres. A circle within the boundaries of one-quarter-section of land contains about 125.7 acres. Thus, sprinkler costs in this study are developed for a circle of 125 acres.

Primary crops grown under center pivot sprinklers in southeastern Wyoming are sugar beets, dry beans, corn, alfalfa, small grains, potatoes, and irrigated pasture. These are essentially the same crops grown under furrow irrigation. The major proportion of the potatoes produced in southeastern Wyoming, 6,600 acres in 1977, are grown under sprinkler irrigation. Only a limited acreage is produced using furrow irrigation.

OBJECTIVE

The objective of this report is to gather, organize and report current cost of production data for sprinkler irrigated crops grown in southeastern Wyoming. Budget data can be evaluated to indicate relative profitabilities of sprinkler grown crops and comparisons made with costs for furrow irrigated crops. The relative physical requirements can also be compared and used for planning purposes.

THE STUDY AREA

Sprinkler irrigated lands in southeastern Wyoming lie at elevations of about

4,100 to 5,300 feet above sea level. Thus, frost free growing seasons do vary within the area:

Average dates for 32°F^{a/}

Station	Last spring freeze	First fall freeze	Frost free days
Torrington	May 18	Sept. 22	127
Wheatland	May 15	Sept. 25	133
LaGrange	May 24	Sept. 21	120
Lusk	May 26	Sept. 18	115
Pine Bluffs	May 21	Sept. 21	124

Annual precipitation also varies for different locations within the area:

Average precipitation (inches)^{b/}

Station	Annual	April thru August	
		Inches	% of annual
Torrington	13.50	9.43	69.8
Wheatland	12.45	8.46	67.9
LaGrange	16.00	10.24	64.0
Lusk	15.00	10.06	67.1
Pine Bluffs	14.17	10.20	71.9

Annual precipitation in southeastern Wyoming averages about 12 to 16 inches.

^{a/} Source: Becker, Alyea and Eppson, Probabilities of Freeze in Wyoming, Univ. of Wyo., Agric. Exp. Sta. Bull. 381, July 1961. There is a 50-50 chance the last spring freeze will occur after the dates shown and a 50-50 chance the first fall freeze will occur before dates shown.

^{b/} Becker and Alyea, Precipitation Probabilities in Wyoming, Agric. Exp. Sta. Bull. 416, June 1964.

This is one reason southeastern Wyoming is a primary dryland winter wheat area. With supplemental water provided through sprinkler irrigation higher water requirement crops can be grown. About 65 to 70 percent of annual precipitation in southeastern Wyoming is received during the growing season. This significantly reduces the amount of water needed via irrigation.

IRRIGATION WATER REQUIREMENTS

The amount of water necessary to produce crops under sprinkler irrigation varies by crop and with local seasonal weather conditions. The State Engineer's Office has published calculated consumptive irrigation requirements for crops grown in Wyoming.^{a/} These calculated irrigation requirements are in addition to effective rainfall received during the growing season. The calculated requirements are useful as guides for planning irrigation systems and average annual crop needs:

Calculated consumptive irrigation requirements in inches^{b/}

Crop	Wheat-land	Torrington	Pine Bluffs	La Grange	Lusk
Alfalfa	24.19	23.06	21.86	21.25	20.13
Beans	12.97	11.65	10.98	11.37	11.68
Corn	19.23	17.82	16.45	16.67	16.13
Pasture	22.23	21.12	19.94	19.33	18.46
Potatoes	14.84	14.02	12.80	13.03	12.98
Small grains	13.56	12.02	11.52	11.34	10.84
Sugar beets	17.56	16.66	15.39	15.41	15.43

For this report, irrigators were asked to "estimate the gross amount of water applied to crops for the summer of 1977." These estimates with total energy or electricity charges obtained from suppliers were used to calculate electricity cost to pump and apply one gross acre inch of water.

Gross irrigation water applications multiplied by an irrigation efficiency factor gives net application which can be compared to calculated consumptive requirements. Estimated application efficiency for center pivot systems varies with weather conditions but 80% might be a reasonable figure. Thus, application rates reported by farmers for 1977, shown below, were slightly higher than calculated consumptive rates for beans and sugarbeets but 20 to 25% below calculated rates for other crops. Users of the crop budgets, to be presented subsequently, should therefore use application rates fitting specific cases being analyzed.

^{a/} Consumptive Use of Irrigation Water in Wyoming, Wyoming Water Planning Report No. 5, Water Resources Series No. 19., published by State Engineer's Office, Cheyenne, Wyo., July 1970.

^{b/} Ibid.

Estimated gross application rates for various crops were:

Crop	Acres
Alfalfa	22
Beans	16
Corn	16
Pasture	22
Potatoes	14
Small grains	12
Sugar beets	22

ELECTRICITY COSTS

Based on irrigators' estimates of gross water applied to various crops and total power charges, as discussed above, the following rates for pumping and applying water were determined:

Electricity cost to pump and apply water	
Static lift in feet	Power cost/gross acre inch applied
100	\$.80
10	\$.65

The above rates include charges for hookup and for energy consumed. The per acre inch electricity rates are used in calculating energy charges for each crop. For example,

^{a/} Investments, annual costs and details are shown in Appendix Worksheet VI.

the electricity charge for pumping and distributing water onto sugar beets from a 100 ft. well is: 22 acre inches @ \$.80 equals \$17.60/acre. To pump from a surface source or 10 ft. lift, the charge would be: 22 acre inches @ \$.65 equals \$14.30/acre. Power charges included in subsequent budgets are all based on the 100 ft. lift, 100 hp, electric motor system.

SPRINKLER SYSTEM COSTS

Investment requirements and costs for owning and operating center pivot sprinkler systems, as used in the crop budgets are summarized below.^{a/} The investment requirement shown is estimated for a 5 year old sprinkler system. New systems would cost more than shown here while older systems probably required a lower investment.

A. Investment requirements (5 year old system)

Item	Present value	Salvage value	Depreciable value
<u>Pump from well, 100 hp:</u>			
Sprinkler & pivot	\$20,800	\$ 4,160	\$16,640
Motor, pump, panel, hookup	8,136	2,441	5,695
Well (16", 125' deep)	3,000	600	2,400
Mainline pipe, 1320'	<u>4,012</u>	<u>1,605</u>	<u>2,497</u>
Totals	\$35,948	\$ 8,806	\$27,232

--Continued--

--Continued--

Item	Present value	Salvage value	Depreciable value
<u>Pump from surface, 75 hp:</u>			
Sprinkler & pivot	\$20,800	\$4,160	\$16,640
Motor, pump, panel, hookup	3,800	1,140	2,660
Mainline pipe	4,012	1,605	2,497
Totals	\$28,612	6,905	\$21,797

B. Annual costs for sprinkler systems

	Pump from well 100' lift, 100 hp	Pump from surface 10' lift, 75 hp		
	Total	Per acre	Total	Per acre
Depreciation	\$2,560	\$20.48	\$2,096	\$16.77
Interest	1,937	15.49	1,775	14.20
Taxes	179	1.43	150	1.20
Insurance	107	.86	90	.72
Oil, lube, repairs	402	3.22	346	2.77
Labor	285	2.28	285	2.28
Electricity for 22 ac. in.	2,200	17.60 ^{a/}	1,788	14.30 ^{b/}
Total	\$7,670	\$61.36	\$6,530	\$52.24

^{a/} Charged at \$.80/ac. in. applied.

^{b/} Charged at \$.65/ac. in. applied.

Sprinkler systems in southeastern Wyoming were financed with funds borrowed from various lending agencies. For cash flow analysis annual costs or charges for depreciation and interest, shown above, might be considered as replacing annual principal and interest payments for borrowed capital.

PERFORMANCE RATES

Machine and labor requirements for crops grown under center pivot sprinklers are shown in Appendix Worksheet I. Performance rates for cultural operations are generally more efficient for sprinkler than for furrow irrigated crops. Fields are generally larger and soils easier to work (more sandy) than the common furrow irrigated "bottom-lands."

INPUT DATA

The machinery complement used in budgeting costs for sprinkler irrigated crops is the same as used for furrow irrigated crops, Appendix Worksheets II, III and IV. However, since performance rates for sprinkler crops are more efficient and sometimes fewer operations are required, most costs for specific operations are lower for sprinkler than for furrow irrigated crops.

Shown in Appendix Worksheet V are input prices and application rates used in budgeting costs for sprinkler irrigated crops. The input prices and application rates are the same as for furrow irrigated crops. Specific input

data for potatoes are included in the detailed budget for potatoes (Table 11).

Shown in Appendix Worksheet VI are investment data and costs for owning and operating specialized equipment for sprinkler grown crops. Most of the specialized machines, except for the sprinkler system, are needed for potatoes.

ORGANIZATION OF CROP BUDGETS

All of the sprinkler irrigated crop budgets are organized similarly. Costs are determined for each operation but sub-grouped as follows:

- Preplant
- Plant
- Grow
- Harvest
- General overhead
- Management
- Real estate costs
- Total production and opportunity costs.

Total costs include charges for all resources. Thus, if the operator of the farm is an owner-operator the budgets include cash costs for all purchased inputs plus charges to compensate the owner for his labor and management and for providing his machinery-land-improvement-sprinkler investment.

Cost/unit of production or breakeven selling price is calculated at the bottom of each budget. Total costs divided by expected yield gives the breakeven selling price. The breakeven price would cover costs for all resources at the rates charged in the budgets.

Users of the budgets can easily calculate returns above total costs, returns above cash costs, returns above operations costs or returns above all costs except land. The residual in the latter case is return to land. This procedure will be illustrated later. Returns to other resources can also be calculated. The resulting comparative net returns can be useful in evaluating alternative crops.

NET LAND RENT

Net land rent is determined for each crop. This cost as used here is defined as the net cost to the operator for using the land. Another definition of net land rent is the opportunity cost to the owner of the land for his investment in the land and for managing the land-sprinkler investment. This means that the owner of the land, owner-operator or non-operator owner could receive an amount equal to net land rent by leasing the land with sprinkler to a tenant operator.

The procedure for determining net land rent is shown in Table 1. The procedure is based on crop-share-rental arrangements found in the area.^{a/}

^{a/}It was observed that rental agreements for land with sprinkler systems varied considerably between farms. Therefore, a "customary agreement" could not be easily delineated. Users of the budgets should therefore use the procedure outlined only as a guide for evaluating specific cases.

Table 1. Procedure for determining NET LAND RENT, for crops under CENTER PIVOT SPRINKLERS, Southeastern, Wyo., 1977-78.

	Case farm crops						Alternative crops									
	Sugar beets		Corn-grain		Corn-silage		Dry beans		Alfalfa, baled		Alfalfa, cubed		Barley for feed		Potatoes	
Acres of each crop																
Landowner gross rent:																
Landowner crop share	Beets 25%	Corn 33 1/3%	Silage 33 1/3%	Beans 25%	Hay 40%	Hay 40%	Barley 33 1/3%	Potatoes 40%								
Expected yield/acre	Tops 0%	Stalks 33 1/3%	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Landowner crop share	Tons 20.0	Cwt 55	Tons 22	Cwt 20	Tons 4.5	Tons 4.5	Cwt 40	Cwt 250								
Price/unit	---	Acres 1.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Crop share value	Tons 5.0	Cwt 18.33	Tons 7.33	Cwt 6.66	Tons 1.8	Tons 1.8	Cwt 13.33	Cwt 100								
	---	Acres .33	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	Ton \$ 25.00	Cwt \$ 3.31	Ton \$ 13.55	Cwt \$ 21.10	Ton \$45.17	Ton \$ 55.17	Cwt \$ 3.00	Cwt \$ 2.00								
	Acres \$15.00	Corn \$60.67	Silage \$ 99.32	Beans \$105.50	Bales \$81.30	Cubes \$ 99.30	Barley \$40.00	Potatoes \$200.00								
	Tops ---	Stalks \$ 5.00	---	---	---	---	Straw \$ 5.00	---								
1) GROSS RENT	\$125.00	\$65.67	\$ 99.32	\$105.50	\$81.30	\$ 99.30	\$45.00	\$200.00								
Landowner costs:																
Operations costs:																
Seed Alfalfa (stand)																
Fertilizer share	1/2 13.77	1/3 15.11	1/3 15.11	1/2 3.57	2/5 6.64	2/5 6.64	1/3 8.21	b/ 44.80								
Insecticide, fungicide	1/2 7.75	---	---	1/2 3.00	---	---	---	b/ 32.82								
Nematocide share	1/2 9.45	---	---	---	---	---	---	---								
Electricity	1/2 8.80	1/2 6.40	1/2 6.40	1/2 6.40	1/2 8.80	1/2 8.80	1/2 4.80	All 11.20								
Sprinkler repairs	3.22	3.22	3.22	3.22	3.22	3.22	3.22	c/ 5.50								
Harvest-post harvest	---	---	---	---	2/5 bale 16.20	2/5 cube 27.00	bale 1/3 2.25	bin @ 6c 6.00								
General overhead	4.01	2.54	2.54	1.66	3.57	4.68	1.89	10.29								
2) Subtotal, oper. costs	40.00	27.27	27.27	17.85	38.43	50.34	20.37	110.61								
Real estate costs:																
Improvements:																
Depreciation	a/	a/	a/	a/	a/	a/	a/	a/								
Interest on investment	---	---	---	---	---	---	---	---								
Insurance & taxes	---	---	---	---	---	---	---	---								
Repairs (landowner)	---	---	---	---	---	---	---	---								
Utilities & labor (oper.)	---	---	---	---	---	---	---	---								
Sprinkler system:																
Depreciation & alf. stand	20.48	20.48	20.48	20.48	29.11	29.11	20.48	20.48								
Interest on investment	15.49	15.49	15.49	15.49	17.22	17.22	15.49	15.49								
Insurance & taxes	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29								
Land taxes:	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04								
3) Subtotal, real estate	40.30	40.30	40.30	40.30	50.66	50.66	40.30	40.30								
4) TOTAL landowner costs (2 + 3)	80.30	67.57	67.57	58.15	89.09	101.00	60.67	150.91								
5) NET LAND RENT (1 - 4)	44.70	(1.90)	31.75	47.35	(7.79)	(1.70)	(15.67)	49.09								

a/ It is assumed that costs associated with shop, housing and sheds are provided by tenant operators.

b/ Landowner provides fertilizer, insecticides, herbicides and fungicides for blight.

c/ Landowner pays sprinkler repairs and operates the sprinkler.

d/ Numbers in parenthesis are negative.

The procedure might be clarified by examining the item descriptions and data for feed barley shown in Table 1 and following these steps:

1. The landowner crop share is assumed to be one-third of the barley crop. In this illustration it is also assumed that the landowner gets one-third of the baled straw if it is sold.

2. One-third of the barley and straw times price/unit gives landowner gross rent. In this example gross rent includes \$40 for barley and \$5 for straw for a total of \$45/acre.

3. Landowner operations costs are assumed to be one-third of the fertilizer, one-half of the electricity and all of the sprinkler repairs. It is also assumed that the landowner pays one-third of the cost for baling the straw (\$2.25 for 1/4 ton). He would also incur his share of general overhead which includes miscellaneous and interest on cash costs as included in the budget for feed barley.

4. Landowner real estate costs as included in the feed barley budget, include depreciation, interest on average investment, insurance, taxes and repairs for the sprinkler system. The operator, or tenant, is assumed to provide all costs for other improvements. The landowner would pay taxes on land and irrigation water charges if any.

5. Landowner gross rent minus operations and real estate costs equals NET LAND RENT.

Again, net land rent is defined as the cost to the operator for using the land. It does not matter if the operator is a tenant or owner-operator. If the landowner is a non-operator, net land rent is return to his investment in land and return to his management of the land-sprinkler investment.

Net land rents for each crop, based on the stated price-yield-crop share assumptions and costs developed in subsequent budgets are shown on the bottom line of Table 1. Readers should be reminded that net land rents will vary directly with any changes in prices and/or yields. For example, if the price for feed barley was \$1.50/cwt higher, say \$4.50 rather than \$3/cwt, net land rent for feed barley would be \$4.33/acre profit rather than \$15.67 loss. Also, if landowner costs were higher, net rent would be lower and if yields were lower net rent would be lower. Obviously net rent for sprinkler grown barley at \$3/cwt is negative.

Readers should keep in mind that the situation budgeted is considered to be "above average." Yields, prices and production technologies could be higher than area averages.

It should also be noted that land can appreciate or decline in value over time. Appreciating land values would increase average returns to land investment, if it were sold. Declining land values would reduce average rate of return to land if, or when, it is sold.

It is important to note that THE PRICE for CUBED HAY is set at \$10/ton HIGHER than for BALED HAY. With this price differential and assumed equal yields net rent for cubed

hay is about \$6/acre higher than for baled hay. Readers or users of these budgets should consider local prices and yields of cubes and bales when analyzing specific situations.

Table 6. ADDED COSTS of ESTABLISHING ALFALFA STAND, page 15.

Table 7. Costs of producing ALFALFA (BALED), page 16.

Table 8. Costs of producing ALFALFA (CUBED), page 17.

Table 9. Costs of producing BARLEY for FEED, page 18.

Table 10. Costs of ESTABLISHING a STAND and costs of producing IRRIGATED PASTURE, page 19.

Table 11. Costs of producing POTATOES, page 20.

CROP BUDGETS

The detailed enterprise budgets showing costs of producing crops under sprinklers are shown subsequently:

Table 2. Costs of producing SUGAR BEETS, page 10.

Table 3. Costs of producing CORN for GRAIN, page 12.

Table 4. Costs of producing CORN for SILAGE, page 13.

Table 5. Costs of producing DRY BEANS, page 14.

Item	Quantity	Unit Price	Total Cost
Water	1.73	36	62.28
Electricity	26.16	1.10	28.78
Labor	3.74	1.82	6.81
Other	0.82	1.82	1.49
Total	34.45		103.36
Water	3.81	80	304.80
Electricity	39.48	1.80	71.06
Labor	3.81	80	304.80
Other	3.81	80	304.80
Total	50.91		1668.46
Water	1.73	36	62.28
Electricity	26.16	1.10	28.78
Labor	3.74	1.82	6.81
Other	0.82	1.82	1.49
Total	34.45		103.36
Water	3.81	80	304.80
Electricity	39.48	1.80	71.06
Labor	3.81	80	304.80
Other	3.81	80	304.80
Total	50.91		1668.46
Water	1.73	36	62.28
Electricity	26.16	1.10	28.78
Labor	3.74	1.82	6.81
Other	0.82	1.82	1.49
Total	34.45		103.36
Water	3.81	80	304.80
Electricity	39.48	1.80	71.06
Labor	3.81	80	304.80
Other	3.81	80	304.80
Total	50.91		1668.46

Table 2. Per acre costs of producing SUGAR BEETS, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 20 tons/acre, 125 acre enterprise.

Operation(s)	Trac- tor	F U E L	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre	
				Materials description	Truck miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube
Preplant:															
Rip (subsoil) .2 acre	125	H	3 shank	--	--	.091	.091	.49	.30	.20	.32	.05	--	.36	1.72
Spread fertilizer	70	L	custom	150; 100; 50; S20	--	.079	.159	.21	.10	.11	--	--	55.10	.64	56.16
Disk	100	H	15'	--	--	.182	.182	.68	.52	.32	.92	.57	--	.73	3.74
Plow & pack	125	H	4-18's	--	--	.454	.454	2.43	1.49	1.01	1.68	1.39	--	1.82	9.82
Roller harrow	100	H	15'	--	--	.200	.200	.75	.57	.35	.63	.33	--	.80	3.43
Level	125	H	14'	--	--	.200	.200	1.07	.66	.45	.47	.36	--	.80	3.81
Shank in nematocide	100	H	custom	cost for .6 acre	--	.136	.136	.51	.39	.24	--	--	37.80	.54	39.48
Roller harrow	100	H	15'	--	--	.200	.200	1.07	.66	.45	.47	.36	--	.80	3.81
Subtotal, preplant					--	1.542	1.622	7.21	4.69	3.13	4.49	3.06	92.90	6.49	121.97
Plant:															
Plant and incorporate herbicide	70	H	6 row	2.5 lb seed	--	.417	.417	1.12	.82	.60	1.51	.93	10.37	1.67	17.02
Replant 6% of acres:				10 lb herbicide	--	--	--	--	--	--	1.59	1.06	6.30	--	8.95
Roller harrow	100	H	15'	--	--	.012	.012	.06	.04	.03	.03	.02	--	.05	.23
Plant	70	H	6 row	.15 lb seed	--	.025	.025	.07	.05	.04	.09	.05	.62	.10	1.02
Subtotal, plant					--	.454	.454	1.25	.91	.67	3.22	2.06	17.29	1.82	27.22
Grow:															
Rough, prevent blowing	40	L	stripper	2 times over	--	.454	.454	.87	.66	.57	.82	.38	--	1.82	5.12
Post emerg herbicide	40	L	6 row	cost for .2 acre	--	.045	.045	.09	.06	.06	.12	.09	1.91	.18	2.51
Cultivate, 1st	70	L	6 row	--	--	.357	.357	.96	.45	.51	.51	.69	--	1.43	4.55
Thin, hand labor	--	--	--	hoes \$1, thin \$30	--	--	--	--	--	--	--	--	31.00	--	31.00
Cultivate, 2nd	100	L	6 row	rolling	--	.227	.227	.85	.43	.40	.56	.14	--	.91	3.29
Layby herbicide	40	L	6 row	cost for .2 acre	--	.045	.045	.09	.06	.06	.12	.09	.50	.18	1.10
Cultivate, 3rd	100	L	6 row	rolling	--	.227	.227	.85	.43	.40	.56	.14	--	.91	3.29
Weed, hand labor	--	--	--	--	--	--	--	--	--	--	--	--	15.00	--	15.00
Cultivate, 4th	100	L	6 row	rolling	--	.227	.227	.85	.43	.40	.56	.14	--	.91	3.29
Irrigate, 22 acre in.	--	--	circle	elec. @ \$.80/ac. in.	--	--	.570	--	--	--	--	3.22	17.60	2.28	23.10
Weed, hand labor, 2nd	--	--	--	cost for .6 acre	--	--	--	--	--	--	--	--	9.00	--	9.00
Association dues	--	--	--	6¢/ton	--	--	--	--	--	--	--	--	1.20	--	1.20
Pickups	--	--	½ ton	--	35.0	--	1.167	5.21	1.82	2.52	--	--	--	4.67	14.22
Spray for mildew	--	--	air	cost for .25 acre	--	--	--	--	--	--	--	--	3.00	--	3.00
Subtotal, grow					35.0	1.582	3.319	9.77	4.34	4.92	3.25	4.89	79.21	13.29	119.67

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Table 2. (CONTINUED) Per acre costs of producing SUGAR BEETS, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 20 tons/acre, 125 acre enterprise.

Operation(s)	Tractor	F U L	Imple-ment	Physical data			Power unit costs			Imple. costs		Mater-ials & custom Labor	Total/acre			
				Materials description	Truck miles	Trac-tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed			Repair, lube		
Harvest:																
Top, top saver	100	H	6 row	--	--	.909	.909	3.41	2.58	1.60	14.19	5.18	--	3.64	30.60	
Pull and load	125	H	3 row	--	--	.909	.909	4.86	2.98	2.03	18.31	9.13	--	3.64	40.95	
Haul to dump	--	--	2 ton	6.9 mi/8 tons	17.3	--	2.727	15.48	1.78	6.04	--	--	--	10.91	34.21	
Subtotal, harvest					17.3	1.818	4.545	23.75	7.34	9.67	32.50	14.31	--	18.19	105.76	
Subtotal, preplant through harvest					Pu 35.0; Tk 17.3	5.396	9.940	41.98	17.28	18.39	43.46	24.32	189.40	39.79	374.62	
General overhead:																
Miscellaneous at 5% of above subtotal					1.7	.9	.270	.497	2.10	.86	.92	2.17	1.22	9.47	1.99	18.73
Interest on cash costs at 10% for 6 mo's					--	--	--	--	--	.91	.96	--	1.28	9.94	2.09	15.18
Subtotal, general overhead					1.7	.9	.270	.497	2.10	1.77	1.88	2.17	2.50	19.41	4.08	33.91
Subtotal, preplant thru general overhead					Pu 36.7; Tk 18.2	5.666	10.437	44.08	19.05	20.27	45.63	26.82	208.81	43.87	408.53	
Management: at 5% of expected gross (20 tons at \$25 plus tops 20 tons @ \$2 = \$540 @ .05)																27.00
Subtotal, all operations costs																435.53

Real estate costs:	Subtotals, real estate						Rent, deprec-			Other	
	Net land rent	Deprec-iation	Inter-est	Insurance & taxes	Repairs, utilities	Water & drainage	iation, interest				
Land	44.70	--	--	2.04	--	--	44.70	2.04		46.74	
Shop, metal	--	1.00	2.25	.78	1.25	--	3.25	2.03		5.28	
Machine shed, frame	--	.75	1.12	.36	.26	--	1.87	.62		2.49	
Labor house	--	.83	3.12	.65	2.89	--	3.95	3.54		7.49	
Labor house, beets	--	.64	3.33	.23	2.10	--	3.97	2.33		6.30	
Sprinkler	--	13.31	9.98	1.60	a/	--	23.29	1.60		24.89	
Motor, pump, panel (100 hp)	--	4.56	1.83	.69	a/	--	6.39	.69		7.08	
Well	--	1.28	1.44	--	--	--	2.72	--		2.72	
Mainline pipe	--	1.33	2.24	--	--	--	3.57	--		3.57	
Subtotal, real estate costs	44.70	23.70	25.31	6.35	6.50	--	93.71	12.85		106.56	

TOTAL PRODUCTION AND OPPORTUNITY COSTS ----- 542.09

Total cost/acre \$542.09 minus credit for tops at \$40/acre equals cost for 20 tons beets \$502.09

Cost/ton or breakeven selling price at: 20 tons/acre^{b/} 25.10
 22 tons/acre 22.91
 18 tons/acre 27.79

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

b/ These breakeven prices are after allowing a credit of \$2/ton of beets or \$40/acre for tops.

c/ Fuel use rates are: high (H), medium (M) and low (L) based on draft for the operation. See pages 25 and 26 for details.

Table 3. Per acre costs of producing CORN for GRAIN, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 55 cwt (98 bu)/acre, 125 acre enterprise.

Operation(s)	Trac- tor	U L	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre		
				Materials Description	Trac- tor	Man hours	Fixed	Fuel	Repair, lube	Fixed	Repair, lube					
Preplant:																
Rip (subsoiler) .2 acre	125	H	3 shank	--	--	.091 .091	.49	.30	.20	.32	.05	--	.36	1.72		
Spread fertilizer	70	L	custom	N130;P80;Z5	--	.079 .159	.21	.10	.11	--	--	45.34	.64	46.40		
Plow & pack	125	H	4-18's	--	--	.417 .417	2.23	1.37	.93	1.54	1.28	--	1.67	9.02		
Disk	100	H	15'	--	--	.182 .182	.68	.52	.32	.92	.57	--	.73	3.74		
Roller harrow	100	H	15'	--	--	.200 .200	.75	.57	.35	.63	.33	--	.80	3.43		
Subtotal, preplant					--	.969 1.049	4.36	2.86	1.91	3.41	2.23	45.34	4.20	64.31		
Plant:																
Subtotal, plant	70	M	4-32"	20 lb seed @ 60c	--	.303 .303	.81	.48	.43	1.10	.67	12.00	1.21	16.70		
Grow:																
Cultivate 1st	70	L	rolling	--	--	.357 .357	.96	.45	.51	.88	.22	--	1.43	4.45		
Spray weeds	40	L	sprayer	1 lb 2, 4-D	--	.159 .159	.30	.23	.20	.44	.33	2.44	.64	4.58		
Cultivate-ditch	100	L	4 row	--	--	.227 .227	.85	.43	.40	.32	.44	--	.91	3.35		
Pickup, season	--	--	1/2 ton	--	26.0	--	.867	3.87	1.35	1.87	--	--	3.47	10.56		
Irrigate, 16 acre in.	--	--	circle	elec @\$.80/ac.in	--	--	.570	--	--	--	3.22	12.80	2.28	18.30		
Subtotal, grow					26.0	.743	2.180	5.98	2.46	2.98	1.64	4.21	15.24	8.73	41.24	
Harvest:																
Combine	--	--	14' SP	--	--	.454	7.42	1.41	4.33	--	--	--	1.82	14.98		
Haul corn	--	--	2 ton	22 mi/140cwt	8.6	--	.908	7.70	.88	3.00	--	--	3.63	15.21		
Subtotal, harvest					8.6	--	1.362	15.12	2.29	7.33	--	--	5.45	30.19		
Subtotal, preplant thru harvest					Pu 26.0; Tk 8.6	2.015	4.894	26.27	8.09	12.65	6.15	7.11	72.58	19.59	152.44	
General overhead:																
Miscellaneous at 5% of above subtotal					1.3	.4	.101	.245	1.31	.40	.63	.31	.36	3.63	.98	7.62
Interest on cash costs at 10% for 6 mo's					--	--	--	--	.43	.66	--	.37	3.81	1.03	6.30	
Subtotal, general overhead					1.3	.4	.101	.245	1.31	.83	1.29	.31	.73	7.44	2.01	13.92
Subtotal, preplant thru general overhead					Pu 27.3; Tk 9.0	2.116	5.139	27.58	8.92	13.94	6.46	7.84	80.02	21.60	166.36	
Management: at 5% of expected gross (55 cwt @ \$3.3) + \$15 for stalk pasture = \$197.05 x .05)														9.85		
Subtotal, all operations costs														176.21		

Real estate costs:	Net land rent	Deprec- iation	Inter- est	Insurance & taxes	Repairs, utilities	Water & drainage	Subtotals, real estate		Other	
							Rent, deprec- iation, interest			
Land	(1.90)	--	--	2.04	--	--	--	--	2.04	2.04
Shop, metal	--	1.00	2.25	.78	1.25	--	3.25	2.03	5.28	5.28
Machine shed, frame	--	.75	1.12	.36	.26	--	1.87	.62	2.49	2.49
Labor house	--	.83	3.12	.65	2.89	--	3.95	3.54	7.49	7.49
Labor house, beets	--	--	--	--	--	--	--	--	--	--
Sprinkler	--	13.31	9.98	1.60	a/	--	23.29	1.60	24.89	24.89
Motor, pump, panel (100 hp)	--	4.56	1.83	.69	a/	--	6.39	.69	7.08	7.08
Well	--	1.28	1.44	--	--	--	2.72	--	2.72	2.72
Mainline pipe	--	1.33	2.24	--	--	--	3.57	--	3.57	3.57
Subtotal, real estate costs	(1.90)	23.06	21.98	6.12	4.40	--	45.04	10.52	55.56	55.56

TOTAL PRODUCTION AND OPPORTUNITY COSTS----- 231.77

Total cost/acre \$231.77, minus cost for stalk pasture, \$15 equals cost for corn \$216.77

	Yield	Cost/cwt	Yield	Cost/bu
Cost/unit or breakeven selling price at:	55 cwt	3.94	or 98bu	2.21
	65 cwt	3.38	or 116bu	1.89
	45 cwt	4.76	or 80bu	2.67

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

Table 4. Per acre costs of producing CORN FOR SILAGE, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 22 tons/acre, 62 acre enterprise.

Operation (s)	Tractor	F U E L Imple- ment	Physical data				Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre
			Materials description	Trac- tor miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed	Repair, lube			
Preplant:														
Rip (subsoiler) .2 acre	125	H 3 shank	--	--	.091	.091	.49	.30	.20	.32	.05	--	.36	1.72
Spread fertilizer	70	L custom	N130; P80; Z5	--	.079	.159	.21	.10	.11	--	--	45.34	.64	46.40
Plow & pack	125	H 4-18's	--	--	.417	.417	2.23	1.37	.93	1.54	1.28	--	1.67	9.02
Disk	100	H 15'	--	--	.182	.182	.68	.52	.32	.92	.57	--	.73	3.74
Roller harrow	100	H 15'	--	--	.200	.200	.75	.57	.35	.63	.33	--	.80	3.43
Subtotal, preplant					.969	1.049	4.36	2.86	1.91	3.41	2.23	45.34	4.20	64.31
Plant:														
Subtotal, plant	70	M 4-32"	20 lb seed @ 60¢	--	.303	.303	.81	.48	.43	1.10	.67	12.00	1.21	16.70
Grow:														
Cultivate, 1st	70	L rolling	--	--	.357	.357	.96	.45	.51	.88	.22	--	1.43	4.45
Spray weeds	40	L sprayer	1 lb 2, 4-D	--	.159	.159	.30	.23	.20	.44	.33	2.44	.64	4.58
Cultivate - ditch	100	L 4 row	--	--	.227	.227	1.85	.43	.40	.32	.44	--	.91	3.35
Pickup, season	--	- ½ ton	--	26.0	--	.867	3.87	1.35	1.87	--	--	--	3.47	10.56
Irrigate, 16 acre in.	--	- circle	elec @ \$.80/ac. in.	--	--	.570	--	--	--	--	3.22	12.80	2.28	18.30
Subtotal, grow				26.0	.743	2.180	5.98	2.46	2.98	1.64	4.21	15.24	8.73	41.24
Harvest:														
Chop	125	H 2 row	--	--	.769	.769	4.11	2.52	1.71	10.45	7.13	--	3.08	29.00
Haul, 3 trucks	--	- 2 ton	6 mi/6T	22.0	--	2.307	19.69	2.27	7.68	--	--	--	9.23	38.87
Pack	100	M blade	--	--	.769	.769	2.88	1.81	1.35	1.21	.29	--	3.08	10.62
Subtotal, harvest				22.0	1.538	3.845	26.68	6.60	10.74	11.66	7.42	--	15.39	78.49
Subtotal, preplant thru harvest			Pu 26.0; Tk 22.0	22.0	3.553	7.377	37.83	12.40	16.06	17.81	14.53	72.58	29.53	200.74
General overhead:														
Miscellaneous at 5% of above subtotal				1.3	1.1	.178	1.89	.62	.80	.89	.73	3.63	1.48	10.04
Interest on cash costs at 10% for 6 mo's				--	--	--	--	.65	.84	--	.76	3.81	1.55	7.61
Subtotal, general overhead				1.3	1.1	.178	1.89	1.27	1.64	.89	1.49	7.44	3.03	17.65
Subtotal, preplant thru general overhead			Pu 27.3; Tk 23.1	22.0	3.731	7.746	39.72	13.67	17.70	18.70	16.02	80.02	32.56	218.39
Management: at 5% of expected gross (22 tons at \$13.55 = \$298.10 x .05)														
Subtotal, all operations costs														14.90
														233.29

Real estate costs:	Subtotals, real estate							Other	
	Net land rent	Deprec- iation	Inter- est	Insurance & taxes	Repairs, utilities	Water & drainage	Rent, deprec- iation, interest		
Land	31.75	--	--	2.04	--	--	31.75	2.04	33.79
Shop, metal	--	1.00	2.25	.78	1.25	--	3.25	2.03	5.28
Machine shed, frame	--	.75	1.12	.36	.26	--	1.87	.62	2.49
Labor house	--	.83	3.12	.65	2.89	--	3.95	3.54	7.49
Labor house, beets	--	--	--	--	--	--	--	--	--
Sprinkler	--	13.31	9.98	1.60	a/	--	23.29	1.60	24.89
Motor, pump, panel (100 hp)	--	4.56	1.83	.69	a/	--	6.39	.69	7.08
Well	--	1.28	1.44	--	--	--	2.72	--	2.72
Mainline pipe	--	1.33	2.24	--	--	--	3.57	--	3.57
Subtotal, real estate costs	31.75	23.06	21.98	6.12	4.40	--	76.79	10.52	87.31

TOTAL PRODUCTION AND OPPORTUNITY COSTS ----- 320.60

Cost/ton or breakeven selling price at: 22 tons/acre 14.57
 24 tons/acre 13.51
 20 tons/acre 15.85

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

Table 5. Per acre costs of producing DRY BEANS, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 20 cwt/acre, 62 acre enterprise.

Operation(s)	Trac- tor	F U E L	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre		
				Materials description	Truck miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube	
																-----\$/acre-----
Preplant:																
Rip (subsoiler) .2 acre	125	H	3 shank	--	--	.091	.091	.49	.30	.20	.32	.05	--	.36	1.72	
Spread fertilizer	70	L	custom	N18; P46; Z3	--	.079	.159	.21	.10	.11	--	--	14.28	.64	15.34	
Plow & pack	125	H	4-18's	--	--	.417	.417	2.23	1.37	.93	1.54	1.28	--	1.67	9.02	
Roller harrow	100	H	15'	--	--	.200	.200	.75	.57	.35	.63	.33	--	.80	3.43	
Spray on herbicides	--	-	custom	apply \$2.50	--	--	--	--	--	--	--	--	11.25	--	11.25	
Roller harrow	100	H	15'	--	--	.200	.200	.75	.57	.35	.63	.33	--	.80	3.43	
Subtotal, preplant					--	.987	1.067	4.43	2.91	1.94	3.12	1.99	25.53	4.27	44.19	
Plant:																
Haul seed	--	-	2 ton	--	.26	--	.060	.23	.03	.09	--	--	--	.24	.59	
Plant	70	M	6 row	70 lb. @ 23c	--	.303	.303	.81	.48	.43	1.10	.67	16.10	1.21	20.80	
Subtotal, plant					.26	.303	.363	1.04	.51	.52	1.10	.67	16.10	1.45	21.39	
Grow:																
Spike harrow	40	H	24'	--	--	.182	.182	.35	.39	.23	.26	.26	--	.73	2.22	
Cultivate, 1st	70	L	6 row	--	--	.357	.357	.96	.45	.51	.51	.69	--	1.43	4.55	
Cultivate, 2nd	100	L	6 row	rolling	--	.227	.227	.85	.43	.40	.56	.14	--	.91	3.29	
Pull weeds	--	-	--	cost for .5 acre	--	--	--	--	--	--	--	--	7.50	--	7.50	
Pickup, season	--	-	½ ton	--	28.0	--	.933	4.17	1.46	2.02	--	--	--	3.73	11.38	
Irrigate, 16 acre in.	--	-	circle	elec. @ \$.80/acre inch	--	--	.570	--	--	--	--	3.22	12.80	2.28	18.30	
Spray for mildew	--	-	custom	air	--	--	--	--	--	--	--	--	12.00	--	12.00	
Subtotal, grow					28.0	.766	2.269	6.33	2.73	3.16	1.33	4.31	32.30	9.08	59.24	
Harvest:																
Cut & rod weed	70	H	6 row	--	--	.500	.500	1.34	.99	.71	2.03	1.86	--	2.00	8.93	
Rake	40	L	8'	--	--	.500	.500	.95	.72	.62	1.40	.59	--	2.00	6.28	
Combine	--	-	14' SP	--	--	--	.454	7.42	1.41	4.33	--	--	--	1.82	14.98	
Haul beans	--	-	2 ton	21.7 ml/140 cwt	3.1	--	.908	2.77	.32	1.08	--	--	--	3.63	7.80	
Subtotal, harvest					3.1	1.000	2.362	12.48	3.44	6.74	3.43	2.45	--	9.45	37.99	
Post harvest: Field cult.	125	H	15'	--	--	.200	.200	1.07	.66	.45	2.86	.56	--	.80	6.40	
Subtotal, preplant thru post harvest					Pu 28.0; Tk 3.36	3.256	6.261	25.35	10.25	12.81	11.84	9.98	73.93	25.05	169.21	
General overhead:																
Miscellaneous at 5% of above subtotal					1.4	.17	.163	.313	1.27	.51	.64	.59	.50	3.70	1.25	8.46
Interest on cash costs at 10% for 6 mo's					--	--	--	--	.54	.67	--	.52	3.88	1.32	6.93	
Subtotal, general overhead					1.4	.17	.163	.313	1.27	1.05	1.31	.59	1.02	7.58	2.57	15.39
Subtotal, preplant thru general overhead					Pu 29.4; Tk 3.53	3.419	6.574	26.62	11.30	14.12	12.43	11.00	81.51	27.62	184.60	
Management: at 5% of expected gross (20 cwt at \$21.10 = \$422 x .05)															21.10	
Subtotal, all operations costs															205.70	

Real estate costs:	Subtotals, real estate						Other		
	Net land rent	Deprec- iation	Inter- est	Insurance & taxes	Repairs, utilities	Water & drainage			Rent, deprec- iation, interest
Land	47.35	--	--	2.04	--	--	47.35	2.04	49.39
Shop, metal	--	1.00	2.25	.78	1.25	--	3.25	2.03	5.28
Machine shed, frame	--	.75	1.12	.36	.26	--	1.87	.62	2.49
Labor house	--	.83	3.12	.65	2.89	--	3.95	3.54	7.49
Labor house, beets	--	--	--	--	--	--	--	--	--
Sprinkler	--	13.31	9.98	1.60	a/	--	23.29	1.60	24.89
Motor, pump, panel (100 hp)	--	4.56	1.83	.69	a/	--	6.39	.69	7.08
Well	--	1.28	1.44	--	--	--	2.72	--	2.72
Mainline pipes	--	1.33	2.24	--	--	--	3.57	--	3.57
Subtotal, real estate costs	47.35	23.06	21.98	6.12	4.40	--	92.39	10.52	102.91

TOTAL PRODUCTION AND OPPORTUNITY COSTS-----308.61

Cost/unit or breakeven selling price at: 20 cwt/acre (33.3 bu) 15.43
 18 cwt/acre (30.0 bu) 17.07
 22 cwt/acre (36.6 bu) 14.08

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

Table 6. Per acre ADDED COSTS of ESTABLISHING ALFALFA STAND, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Alfalfa drilled into stubble after harvesting barley or oats.

Operation(s)	Tractor	Fuel U	Implement	Physical data			Power unit costs			Imple. costs		Materials & custom	Labor	Total/acre	
				Materials description	Truck miles	Tractor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube
Plant:															
Spread fertilizer	70	L	custom	0-40-0	--	.079	.159	--	.10	.11	--	--	6.52	.64	7.37
Drill alfalfa seed	40	L	12'	12 lb. @ \$1.70	--	.303	.303	--	.53	.38	--	.21	20.40	1.21	22.73
Subtotal, plant					--	.382	.462	--	.63	.49	--	.21	26.92	1.85	30.10
Grow:															
Irrigate, 4 acre in.	--	--	circle	elec. @ \$.80/ac.in	--	--	.142	--	--	--	--	--	3.20	.57	3.77
Pickups	--	--	1/2 ton	--	6.5	--	.217	--	.34	.47	--	--	--	.87	1.68
Subtotal, grow					6.5	--	.359	--	.34	.47	--	--	3.20	1.44	5.45
Subtotal, plant thru grow					Pu 6.5	.382	.821	--	.97	.96	--	.21	30.12	3.29	35.55
Interest: on cash costs at 10% for 3 mo's					--	--	--	--	.03	.02	--	.01	.75	.08	.89
ADDED COSTS to establish alfalfa stand ^{a/}					Pu 6.5	.382	.821	--	1.00	.98	--	.22	30.87	3.37	36.44

Summary of total costs to establish alfalfa stand:

Item	Units/acre	Owner-operator	Land-owner	Tenant operator
		\$/acre		
Tractor and drill:	.382 hr			
Fuel		.63	--	.63
Repair & lube		.70	--	.70
Pickups:	6.5 mi			
Fuel		.34	--	.34
Repair & lube		.47	--	.47
Labor	.821 hr	3.29	--	3.29
Electricity	4 acre in.	3.20	1.60	1.60
Alfalfa seed	12 lb @ \$1.70	20.40	20.40	--
Fertilizer	40 units P ₂ O ₅	6.52	3.26	3.26
Interest on cash	10% for 3 mo's	.89	.63	.26
TOTAL costs for STAND		36.44	25.89	10.55
ANNUAL costs for STAND:				
Depreciation:	\$36.44 / 3 years	12.15	8.63	3.52
Interest on ave. inv.	$\frac{\$36.44 + 12.15}{2} (.10)$	2.43	1.73	.70
ANNUAL costs for STAND		14.58	10.36	4.22

a/ It is assumed that annual fixed costs for machinery and the sprinkler system are charged to the barley crop. Thus, costs shown are "added" for establishing the alfalfa stand.

Table 7. Per acre costs of producing ALFALFA (BALED), CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 4.5 tons baled hay/acre, 3 cuttings.

Operation(s)	Trac- tor	F uel	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre	
				Materials description	Trac- tor miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube
Plant:															
Establish stand	--	-	--	operator share	--	--	--	--	--	--	--	--	--	4.22	
Grow:															
Spread fertilizer	70	L	custom	P80; K10; S25	--	.079	.159	.21	.10	.11	--	--	16.60	.64	17.66
Roller harrow	100	H	15'	--	--	.200	.200	.75	.57	.35	.63	.33	--	.80	3.43
Irrigate, 22 acre in.	--	-	circle	elec. \$.80/ac. in.	--	--	.570	--	--	--	--	3.22	17.60	2.28	23.10
Pickups, season	--	-	½ ton	--	22.0	--	.733	3.28	1.14	1.58	--	--	--	2.93	8.93
Subtotal, grow					22.0	.279	1.662	4.24	1.81	2.04	.63	3.55	34.20	6.65	53.12
Harvest:															
Swath, 3 times	--	-	custom	\$5/time over	--	--	--	--	--	--	--	--	15.00	--	15.00
Bale, 3 times	--	-	custom	\$9/ton	--	--	--	--	--	--	--	--	40.50	--	40.50
Stack bales, 3 times	--	-	custom	\$5/ton	--	--	--	--	--	--	--	--	22.50	--	22.50
Subtotal, harvest					--	--	--	--	--	--	--	--	78.00	--	78.00
Subtotal, grow thru harvest					22.0	.279	1.662	4.24	1.81	2.04	.63	3.55	112.20	6.65	131.12
General overhead:															
Miscellaneous at 5% of above subtotal					1.1	.014	.083	.21	.09	.10	.03	.18	5.61	.33	6.55
Interest on cash costs at 10% for 6 mo's					--	--	--	--	.09	.11	--	.19	5.89	.35	6.63
Subtotal, general overhead					1.1	--	--	.21	.18	.21	.03	.37	11.50	.68	13.18
Subtotal, grow thru general overhead					Pu 23.1	.293	1.745	4.45	1.99	2.25	.66	3.92	123.70	7.33	144.30
Management: at 5% of expected gross (4.5 tons @ \$45.17 = \$203.26 x .05)															10.16
Subtotal, all operations costs															158.68
													Subtotals, real estate		
Real estate costs:				Net land	Deprec-	Inter-	Insurance	Repairs,	Water &	Rent, deprec-		Other			
				rent	iation	est	& taxes	utilities	drainage	iation, interest					
Land				(7.79)	--	--	2.04	--	--	--		2.04		2.04	
Shop, metal				--	1.00	2.25	.78	1.25	--	3.25		2.03		5.28	
Machine shed, frame				--	.75	1.12	.36	.26	--	1.87		.62		2.49	
Labor house				--	.83	3.12	.65	2.89	--	3.95		3.54		7.49	
Sprinkler				--	13.31	9.98	1.60	-a/	--	23.29		1.60		24.89	
Motor, pump, panel (100 hp)				--	4.56	1.83	.69	-a/	--	6.39		.69		7.08	
Well				--	1.28	1.44	--	--	--	2.72		--		2.72	
Mainline pipe				--	1.33	2.24	--	--	--	3.57		--		3.57	
Alfalfa stand (landowner)				--	8.63	1.73	--	--	--	10.36		--		10.36	
Subtotal, real estate costs				(7.79)	31.69	23.71	6.12	4.40	--	55.40		10.52		65.92	
TOTAL PRODUCTION AND OPPORTUNITY COSTS														224.60	
Cost/unit or breakeven selling price at:															
														4.5 tons/acre	
														5.0 tons/acre	
														4.0 tons/acre	
														49.91	
														46.32	
														54.40	

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

Table 8. Per acre costs of producing ALFALFA (CUBED), CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 4.5 tons cubes/acre, 3 cuttings.

Operation(s)	Trac- tor	F u e l	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre		
				Materials description	Trac- tor miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube	
Plant:																
Establish stand	--	--	--	operator share	--	--	--	--	--	--	--	--	--	4.22		
Grow:																
Spread fertilizer	70	L	custom	P80; K10; S25	--	.079	.159	.21	.10	.11	--	--	16.60	.64	17.66	
Roller harrow	100	H	15'	--	--	.200	.200	.75	.57	.35	.63	.33	--	.80	3.43	
Irrigate, 22 acre in.	--	--	circle	elec. \$.80/ac. in.	--	--	.570	--	--	--	--	3.22	17.60	2.28	23.10	
Pickups, season	--	--	1/2 ton	--	22.0	--	.733	3.28	1.14	1.58	--	--	--	2.93	8.93	
Subtotal, grow					22.0	.279	1.662	4.24	1.81	2.04	.63	3.55	34.20	6.65	53.12	
Harvest:																
Swath, 3 times	--	--	custom	\$5/time over	--	--	--	--	--	--	--	--	15.00	--	15.00	
Cube, 3 times (4.5T)	--	--	custom	\$15/ton	--	--	--	--	--	--	--	--	67.50	--	67.50	
Haul cubes	--	--	2 ton	3.3 mi/4.5 tons	3.3	--	.550	2.95	.34	1.15	--	--	--	2.20	6.64	
File cubes	70	L	ft 'ldr	45 T/5 hr	--	.500	.500	1.35	.62	.71	.78	.68	--	2.00	6.14	
Subtotal, harvest					3.3	.500	1.050	4.30	.96	1.86	.78	.68	82.50	4.20	95.28	
Post harvest:																
Load cubes	70	L	ft 'ldr	45 T/2.5 hrs	--	.250	.250	.67	.31	.36	.39	.34	--	1.00	3.07	
Subtotal, grow thru post harvest					Pu 22.0; Tk	3.3	1.029	2.962	9.21	3.08	4.26	1.80	4.57	116.70	11.85	151.47
General overhead:																
Miscellaneous at 5% of above subtotal					1.1	.2	.051	.148	.46	.15	.21	.09	.23	5.84	.59	7.57
Interest on cash costs at 10% for 6 mo's					--	--	--	--	--	.16	.22	--	.24	6.13	.62	7.37
Subtotal, general overhead					1.1	.2	.051	.148	.46	.31	.43	.09	.47	11.97	1.21	14.94
Subtotal, grow thru general overhead					Pu 23.1; Tk	3.5	1.080	3.110	9.67	3.39	4.69	1.89	5.04	128.67	13.06	166.41
Management: at 5% of expected gross (4.5 tons cubes at \$55.17 (\$10/ton higher than bales) = \$248.26 x .05)																12.41
Subtotal, all operations costs																183.04
													Subtotals, real estate			
Real estate costs:				Net land	Deprec-	Inter-	Insurance	Repairs,	Water &	Rent, deprec-			Other			
				rent	iation	est	& taxes	utilities	drainage	iation,	interest					
Land				(1.70)	--	--	2.04	--	--	--	--	--	2.04	2.04		
Shop, metal				--	1.00	2.25	.78	1.25	--	3.25	--	2.03	--	5.28		
Machine shed, frame				--	.75	1.12	.36	.26	--	1.87	--	.62	--	2.49		
Labor house				--	.83	3.12	.65	2.89	--	3.95	--	3.54	--	7.49		
Sprinkler				--	13.31	9.98	1.60	-a/	--	23.29	--	1.60	--	24.89		
Motor, pump, panel (100 hp)				--	4.56	1.83	.69	-a/	--	6.39	--	.69	--	7.08		
Well				--	1.28	1.44	--	--	--	2.72	--	--	--	2.72		
Mainline pipe				--	1.33	2.24	--	--	--	3.57	--	--	--	3.57		
Alfalfa stand (landowner)				--	8.63	1.73	--	--	--	10.36	--	--	--	10.36		
Subtotal, real estate costs				(1.70)	31.69	23.71	6.12	4.40	--	55.40	--	10.52	--	65.92		
TOTAL PRODUCTION AND OPPORTUNITY COSTS													-----		248.96	
Cost/unit or breakeven selling price at:																
4.5 tons/acre															55.32	
5.0 tons/acre															51.51	
4.0 tons/acre															60.10	

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

Table 9. Per acre costs of producing BARLEY for FEED, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 40 cwt (80 bu)/acre, 62 acre enterprise.

Operation(s)	Trac- tor	F U E I	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre		
				Materials description	Truck miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube	
Preplant:																
Rip (subsoiler) .2 acre	125	H	3 shank	--	--	.091	.091	.49	.30	.20	.32	.05	--	.36	1.72	
Spread fertilizer	70	L	custom	N60; P40; K20	--	.079	.159	.21	.10	.11	--	--	21.24	.64	22.30	
Plow & pack	125	H	4-18's	--	--	.417	.417	2.23	1.37	.93	1.54	1.28	--	1.67	9.02	
Roller harrow, 2 times	100	H	15'	--	--	.400	.400	1.50	1.14	.70	1.26	.66	--	1.60	6.86	
Subtotal, preplant					--	.987	1.067	4.43	2.91	1.94	3.12	1.99	21.24	4.27	39.90	
Plant:																
Haul seed	--	-	2 ton	--	.33	--	.064	.29	.03	.11	--	--	--	.26	.69	
Plant	40	M	12'	100 lb. @ 8c	--	.303	.303	.58	.53	.38	1.79	.21	8.00	1.21	12.70	
Subtotal, plant					.33	.303	.367	.87	.56	.49	1.79	.21	8.00	1.47	13.39	
Grow:																
Spray for weeds	40	L	sprayer	3/4 lb. 2, 4-D	--	.159	.159	.30	.23	.20	.44	.33	1.83	.64	3.97	
Pickup, season	--	-	1/2 ton	--	22.0	--	.733	3.28	1.14	1.58	--	--	--	2.93	8.93	
Irrigate, 12 acre in.	--	-	circle	elec. @ \$.80/acre inch	--	--	.570	--	--	--	--	3.22	9.60	2.28	15.10	
Subtotal, grow					22.0	.159	1.462	3.58	1.37	1.78	.44	3.55	11.43	5.85	28.00	
Harvest:																
Swath	--	-	14' SP	custom	--	--	--	--	--	--	--	--	5.00	--	5.00	
Combine	--	-	14' SP	--	--	--	.454	7.42	1.41	4.33	--	--	--	1.82	14.98	
Haul barley	--	-	2 ton	16.5 mi/150 cwt	4.4	--	.908	3.94	.45	1.54	--	--	--	3.63	9.56	
Subtotal, harvest					4.4	--	1.362	11.36	1.86	5.87	--	--	5.00	5.45	29.54	
Post harvest:																
Rake straw	40	L	8'	--	--	.167	.167	.32	.24	.21	.47	.20	--	.67	2.11	
Bale & stack straw	--	-	custom	.75 ton @ \$14	--	--	--	--	--	--	--	--	10.50	--	10.50	
Subtotal, post harvest					--	.167	.167	.32	.24	.21	.47	.20	10.50	.67	12.61	
Subtotal, preplant thru post harvest					Pu 22.0; Tk 4.73	1.616	4.425	20.56	6.94	10.29	5.82	5.95	56.17	17.71	123.44	
General overhead:																
Miscellaneous at 5% of above subtotal					1.1	.24	.081	.221	1.03	.35	.51	.29	.30	2.81	.88	6.17
Interest on cash costs at 10% for 6 mo's					--	--	--	--	--	.36	.54	--	.31	2.95	.93	5.09
Subtotal, general overhead					1.1	.24	.081	.221	1.03	.71	1.05	.29	.61	5.76	1.81	11.26
Subtotal, preplant thru general overhead					Pu 23.1; Tk 4.97	1.697	4.646	21.59	7.65	11.34	6.11	6.56	61.93	19.52	134.70	
Management: at 5% of expected gross (40 cwt at \$3 = \$120 plus .75 ton straw at \$20 = \$135 x .05)																
Subtotal, all operations costs																6.75
																141.45

Real estate costs:	Subtotals, real estate						Other		
	Net land rent	Deprec- iation	Inter- est	Insurance & taxes	Repairs, utilities	Water & drainage			Rent, deprec- iation, interest
Land	Neg.	--	--	2.04	--	--	--	2.04	2.04
Shop, metal	--	1.00	2.25	.78	1.25	--	3.25	2.03	5.28
Machine shed, frame	--	.75	1.12	.36	.26	--	1.87	.62	2.49
Labor house	--	.83	3.12	.65	2.89	--	3.95	3.54	7.49
Labor house, beets	--	--	--	--	--	--	--	--	--
Sprinkler	--	13.31	9.98	1.60	a/	--	23.29	1.60	24.89
Motor, pump, panel (100 hp)	--	4.56	1.83	.69	a/	--	6.39	.69	7.08
Well	--	1.28	1.44	--	--	--	2.72	--	2.72
Mainline pipe	--	1.33	2.24	--	--	--	3.57	--	3.57
Subtotal, real estate costs	Neg.	23.06	21.98	6.12	4.40	--	45.04	10.52	55.56

TOTAL PRODUCTION AND OPPORTUNITY COSTS-----197.01

Cost/acre \$197.01 minus value of straw, \$15, equals cost for barley \$182.01

Cost/unit or breakeven selling price at: 40 cwt (80 bu)/acre 4.55
 45 cwt (90 bu)/acre 4.06
 35 cwt (70 bu)/acre 5.18

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

Table 10. Per acre costs of ESTABLISHING a STAND and costs of producing IRRIGATED PASTURE, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 8 animal unit months of grazing/acre.

Operation(s)	Trac- tor	F u e	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre		
				Materials description	Trac- tor miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube	
ESTABLISH STAND:^{a/}																
Spread fertilizer	70	L	custom	40-40-20	--	.079	.159	--	.10	.11	--	--	17.04	.64	17.89	
Drill pasture seed ^{b/}	40	L	12'	--	--	.303	.303	--	.53	.38	--	.21	23.92	1.21	26.25	
Irrigate, 4 acre in.	--	-	circle	elec \$.80/ac. in	--	--	.142	--	--	--	--	--	3.20	.57	3.77	
Pickups	--	--	½ ton	--	6.5	--	.217	--	.34	.47	--	--	--	.87	1.68	
Subtotal					6.5	.382	.821	--	.97	.96	--	.21	44.16	3.29	49.59	
Interest at 10% for 3 mo's					--	--	--	--	.02	.02	--	.01	1.11	.08	1.24	
Total, establish stand					6.5	.382	.821	--	.99	.98	--	.22	45.27	3.37	50.83	
ANNUAL COSTS for PASTURE:																
Grow:																
Spread Fertilizer	70	L	custom	120; 40; 20	--	.079	.159	.21	.10	.11	--	--	33.84	.64	34.90	
Irrigate, 22 acre in.	--	-	circle	elec \$.80/ac. in	--	--	.570	--	--	--	--	3.22	17.60	2.28	23.10	
Pickup, season	--	-	½ ton	--	20.0	--	.667	2.98	1.04	1.44	--	--	--	2.67	8.13	
Rip (subsoiler) .2 acre	125	H	3 shank	--	--	.091	.091	.49	.30	.20	.32	.05	--	.36	1.72	
Subtotal, grow					20.0	.170	1.487	3.68	1.44	1.75	.32	3.27	51.44	5.95	67.85	
General overhead:																
Miscellaneous at 5% of above subtotal					1.0	.008	.074	.18	.07	.09	.01	.16	2.57	.30	3.38	
Interest on cash costs at 10% for 6 mo's					--	--	--	--	.08	.09	--	.17	2.70	.31	3.35	
Subtotal, general overhead					1.0	.008	.074	.18	.15	.18	.01	.33	5.27	.61	6.73	
Subtotal, grow through general overhead					21.0	.178	1.561	3.86	1.59	1.93	.33	3.60	56.71	6.56	74.58	
Management: at 5% of expected gross (8 AUM's at \$10 = \$80 x .05)															4.00	
Subtotal, all operations costs															78.58	
Subtotals, real estate																
Real estate costs:																
Land		Net land rent	Deprec- iation	Inter- est	Insurance & taxes	Repairs, utilities	Water & drainage				Subtotal, rent, deprec- iation, interest	Other				
Shop, metal		neg.	--	--	2.04	--	--				--	2.04			2.04	
Machine shed, frame		--	1.00	2.25	.78	1.25	--				3.25	2.03			5.28	
Labor house		--	.75	1.12	.36	.26	--				1.87	.62			2.49	
Sprinkler		--	.83	3.12	.65	2.89	--				3.95	3.54			7.49	
Motor, pump, panel (100 hp)		--	13.31	9.98	1.60	--	--				23.29	1.60			24.89	
Well		--	4.56	1.83	.69	--	--				6.39	.69			7.08	
Mainline pipe		--	1.28	1.44	--	--	--				2.72	--			2.72	
Pasture stand (annual) ^{c/}		--	1.33	2.24	--	--	--				3.57	--			3.57	
Fences, 1½ miles ^{d/}		--	10.17	3.05	--	--	--				13.22	--			13.22	
Subtotal, real estate costs		neg.	.20	1.00	.10	1.00	--				1.20	1.10			2.30	
TOTAL PRODUCTION AND OPPORTUNITY COSTS			33.43	26.03	6.22	5.40	--				59.46	11.62			71.08	
Cost/unit or breakeven selling price at:																149.66
																18.71
																14.97
																12.47

^{a/} Assumed seed is drilled into stubble following harvest of oats or barley.

^{b/} Potomac Orchard grass 6 lb. at \$.72, Cicer Milkvetch 4 lb. at \$1.75, and Regar Brome 6 lb. at \$2.10.

^{c/} Annual costs for pastures stand: Depreciation: $\frac{\$50.83}{5 \text{ years}} = \10.17 Interest: $\frac{\$50.83 + \$10.17}{2} (.10) = \$3.05$

^{d/} Perimeter fences, Investment \$1,500; Annual costs: dep. \$25, int. \$125, taxes \$13, repairs \$125. No charges included for stock water facilities.

Table 11. Per acre costs of producing POTATOES, CENTER PIVOT SPRENKLER IRRIGATION, Southeastern, Wyo., 1977-78. Yield goal 250 cwt/acre field run; hauled to and elevated into storage; 375 acre enterprise.

Operation(s)	Trac- tor	F u e l	Imple- ment	Physical data			Power unit costs			Imple. costs		Mater- ials & custom	Labor	Total/ acre		
				Materials description	Truck miles	Trac- tor hours	Man hours	Fixed	Fuel	Repair, lube	Fixed				Repair, lube	
Preplant:																
Spread fertilizer	7C	L	custom	N50; P135	--	.079	.159	.21	.10	.11	--	--	32.50	.64	33.56	
Disc	10C	H	15'	--	--	.182	.182	.68	.52	.32	.92	.57	--	.73	3.74	
Plow & packer	12S	H	4-18's	--	--	.417	.417	2.23	1.37	.93	1.54	1.28	--	1.67	9.02	
Subtotal, preplant					--	.678	.758	3.12	1.99	1.36	2.46	1.85	32.50	3.04	46.32	
Plant:																
Cutter, elevator, ft 1'dr, 4 men	--	--	cutter	fungicide 28c/cwt	--	--	.680	.40	.17	.15	1.27	.70	4.76	2.72	10.17	
Haul, seed	--	--	2 ton	8 mi/125 cwt	1.0	--	.400	.89	.10	.35	--	--	--	1.60	2.94	
Plant	12S	H	4 row	1/ cwt seed @ \$6	--	.400	.400	2.14	1.31	.89	3.85	.89	102.00	1.60	112.68	
Subtotal, plant					1.0	.400	1.480	3.43	1.58	1.39	5.12	1.59	106.76	5.92	125.79	
Grow:																
Cultivate, add systemic	70	L	4 row	13 lb Thimet @ 64c	--	.357	.357	.96	.45	.51	1.68	.78	8.32	1.43	14.13	
Cultivate & harrow	100	L	4 row	rolling	--	.227	.227	.85	.43	.40	.88	.46	--	.91	3.93	
Sidedness NH ₃ (rig \$.30)	70	M	custom	N100 @ \$.12	--	.250	.250	.67	.40	.36	--	--	12.30	1.00	14.73	
Herbicide, apply \$3.50	--	--	air	Sencor, 1 lb \$6	--	--	--	--	--	--	--	--	9.50	--	9.50	
Irrigate, 140 acre in.	--	--	circle	elec. \$.80/ac. in.	--	--	.570	--	--	--	--	3.22	11.20	2.28	16.70	
Spray for blight, 3 times	--	--	air	\$5/time over	--	--	--	--	--	--	--	--	15.00	--	15.00	
Pickups, season	--	--	½ ton	--	30.0	--	1.000	4.47	1.56	2.16	--	--	--	4.00	12.19	
Spray vines, apply \$3.50	--	--	1/3 acre	2.5 pts DOW @ \$1.31	--	--	--	--	--	--	--	--	2.25	--	2.25	
Subtotal, grow					30.0	.834	2.404	6.95	2.84	3.43	2.56	4.46	58.57	9.62	88.43	
Harvest & bin:																
Windrow	100	M	2 row	½ acre	--	.400	.400	1.50	.94	.70	3.33	.96	--	1.60	9.03	
Harvest & load	12S	H	2 row	½ acre; 3 p'krs	--	.400	1.600	2.14	1.31	.89	7.18	2.76	--	6.40	20.68	
Haul to storage (3 tk's)	--	--	2 ton	125 cwt/11 mi	22.0	--	1.200	19.69	2.27	7.68	--	--	--	4.80	34.44	
Elevate to bins, 3 men	--	--	40 ft	fungicide 1c/cwt	--	--	1.200	--	--	--	.84	.55	2.50	4.80	8.69	
Subtotal, harvest & bin					22.0	.800	4.400	23.33	4.52	9.27	11.35	4.27	2.50	17.60	72.84	
Post harvest:																
Disc vines	100	H	15'	--	--	.182	.182	.68	.52	.32	.92	.57	--	.73	3.74	
List, field-cult	12S	H	15'	--	--	.200	.200	1.07	.66	.45	2.86	.56	--	.80	6.40	
Subtotal, post harvest					--	.382	.382	1.75	1.18	.77	3.78	1.13	--	1.53	10.14	
Subtotal, preplant thru post harvest:					Pu 30.0; Tk 23.0	3.094	9.424	38.58	12.11	16.22	25.27	13.30	200.33	37.71	343.52	
General overhead:																
Miscellaneous at 5% of above subtotal					1.5	1.1	.155	.471	1.93	.61	.81	1.26	.66	10.02	1.88	17.17
Interest on cash costs at 10% for 6 mo's					--	--	--	--	.64	.85	--	.70	10.52	1.98	14.69	
Subtotal, general overhead					1.5	1.1	.155	.471	1.93	1.25	1.66	1.26	1.36	20.54	3.86	31.86
Subtotal, preplant thru general overhead					Pu 31.5; Tk 24.1	3.249	9.895	40.51	13.36	17.88	26.53	14.66	220.87	41.57	375.38	
Management: at 5% of expected gross (250 cwt at \$2.00 = \$500 x .05)															25.00	
Subtotal, all operations costs															400.38	

Real estate costs:	Subtotals, real estate							Other	
	Net land rent	Deprec- iation	Inter- est	Insurance & taxes	Repairs, utilities	Water & drainage	Rent, deprec- iation, interest		
Land	49.09	--	--	2.04	--	--	49.09	2.04	51.13
Shop, metal	--	1.00	2.25	.78	1.25	--	3.25	2.03	5.28
Machine shed, frame	--	.75	1.12	.36	.26	--	1.87	.62	2.49
Labor house	--	.83	3.12	.65	2.89	--	3.95	3.54	7.49
Sprinkler	--	13.31	9.98	1.60	--	--	23.29	1.60	24.89
Motor, pump, panel (100 hp)	--	4.56	1.83	.69	a/	--	6.39	.69	7.08
Well	--	1.28	1.44	--	a/	--	2.72	--	2.72
Mainline pipe	--	1.33	2.24	--	--	--	3.57	--	3.57
Subtotal, real estate costs	49.09	23.06	21.98	6.12	4.40	--	94.13	10.52	104.65
TOTAL PRODUCTION AND OPPORTUNITY COSTS									505.03

Cost/unit or breakeven selling price at: 250 cwt/acre 2.02
 225 cwt/acre 2.23
 275 cwt/acre 1.84

a/ Repair, electricity and labor costs for the sprinkler system are included with growing costs.

EVALUATION OF BUDGET DATA

Return-Cost Data

Comparative return-cost data for crops are summarized in Table 12. Data for each crop taken from the detailed budgets are shown in one column. This facilitates comparison of gross returns, individual cost items and various measures of net returns for different crops. Based on the price-yield-cost assumptions in this analysis, dry beans was the most profitable crop budgeted. Returns from other crops were not adequate to cover total costs.

Blank spaces are provided for users of the budgets to enter their own price-yield-cost data and thus evaluate profitability for different situations.

Shown at the bottom of Table 12 are returns above total costs, cash costs, operations costs and returns above all costs except land (this residual is return to land). These net returns indicate relative profitability of various crops for 1977.

It must be emphasized that higher yields or prices would increase gross and net returns while lower yields or prices would decrease gross and net returns. Therefore, farmers and others can best use these budgets as a guide in evaluating specific situations.

Physical Data

In addition to the cost-return information available in the crop budgets there is a

considerable amount of physical information that can be useful for planning purposes. Physical data from the crop budgets are summarized in Table 13.

Shown in Table 13 are fertilizers applied as pounds of available plant food. This information can be used to estimate total fertilizer requirements for individual cases. Soil tests are recommended before making final decisions on fertilizer applications.

Also shown are miles of truck and pickup use for each crop which can be used in planning requirements for various situations. In specific cases the distance of the farm from town should be considered.

Tractor requirements for each crop can be used to plan total requirements for various crops. The data can also be helpful in estimating costs and requirements for larger or smaller operations.

Labor requirements for each crop can be used to estimate labor needed for various sizes of farms and combinations of crops.

If fuel prices should change, or if fuel should ever be rationed, it might be useful to know the approximate amount of fuel required to produce various crops. Data from the crop budgets were summarized to obtain the estimated fuel requirements for each crop as shown in the lower part of Table 13. Data show that sugar beets, potatoes and corn for silage require the most fuel while irrigated pasture and barley require the least.

Table 12. Comparative RETURNS AND COSTS for crops, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78.

Line	Sugar beets	Your farm	Corn-grain	Your farm	Corn-silage	Your farm	Dry beans	Your farm
1 Returns:								
2 Crop	Beets	_____	Corn	_____	Silage	_____	Beans	_____
3	Tops	_____	Stalks	_____	--	_____	--	_____
4 Yield/acre	20 tons	_____	55 cwt	_____	22 tons	_____	20 cwt	_____
5	20 tons	_____	--	_____	--	_____	--	_____
6 Price/unit	\$25/ton	_____	\$3.31 cwt	_____	\$13.55 ton	_____	\$21.10 cwt	_____
7	\$2/ton	_____	\$15 acre	_____	--	_____	--	_____
8 Value/acre	\$500.00	_____	\$182.05	_____	\$298.10	_____	\$422.00	_____
9	\$ 40.00	_____	15.00	_____	--	_____	--	_____
10 Gross returns	\$540.00	_____	\$197.05	_____	\$298.10	_____	\$422.00	_____
11 Operations costs:								
12 Labor @ \$4/hr	39.79	_____	19.59	_____	29.53	_____	25.05	_____
13 Fuel	17.28	_____	8.09	_____	12.40	_____	10.25	_____
14 Repair, lube	39.49	_____	16.54	_____	27.37	_____	19.57	_____
15 Seed	10.99	_____	12.00	_____	12.00	_____	16.10	_____
16 Fertilizer	55.10	_____	45.34	_____	45.34	_____	14.28	_____
17 Herbicides	8.71	_____	2.44	_____	2.44	_____	11.25	_____
18 Insect & fungi	3.00	_____	--	_____	--	_____	12.00	_____
19 Nematocide	37.80	_____	--	_____	--	_____	--	_____
20 Other material	2.20	_____	--	_____	--	_____	--	_____
21 Custom charges	54.00	_____	--	_____	--	_____	7.50	_____
22 Electricity	17.60	_____	12.80	_____	12.80	_____	12.80	_____
23 Sprinkler repairs	3.22	_____	3.22	_____	3.22	_____	3.22	_____
24 General overhead (cash)	14.46	_____	6.00	_____	7.26	_____	6.60	_____
25 Subtotal	303.64	_____	126.02	_____	152.36	_____	138.62	_____
26 Interest, 10%, 6 mo's	15.18	_____	6.30	_____	7.61	_____	6.93	_____
27 Subtotal, cash costs	318.82	_____	132.32	_____	159.97	_____	145.55	_____
28 Management, 5% of receipts	27.00	_____	9.85	_____	14.90	_____	21.10	_____
29 Machinery fixed costs	89.71	_____	34.04	_____	58.42	_____	39.05	_____
30 Alfalfa stand (op.)	--	_____	--	_____	--	_____	--	_____
31 Subtotal, operations costs	435.53	_____	176.21	_____	233.29	_____	205.70	_____
32 Real estate costs:								
33 Improvements:								
34 Depreciation	3.22	_____	2.58	_____	2.58	_____	2.58	_____
35 Interest	9.82	_____	6.49	_____	6.49	_____	6.49	_____
36 Insurance & taxes	4.06	_____	3.83	_____	3.83	_____	3.83	_____
37 Repairs & utilities	6.50	_____	4.40	_____	4.40	_____	4.40	_____
38 Subtotal, improvements	23.60	_____	17.30	_____	17.30	_____	17.30	_____
39 Sprinkler system:								
40 Depreciation	20.48	_____	20.48	_____	20.48	_____	20.48	_____
41 Interest	15.49	_____	15.49	_____	15.49	_____	15.49	_____
42 Insurance & taxes	2.29	_____	2.29	_____	2.29	_____	2.29	_____
43 Subtotal, sprinkler	38.26	_____	38.26	_____	38.26	_____	38.26	_____
44 Net land rent:	44.70	_____	--	_____	31.75	_____	47.35	_____
45 TOTAL COSTS (31 + 38 + 43 + 44)	542.09	_____	231.77	_____	320.60	_____	308.61	_____
46 Return above ^{a/} :								
47 Total costs (10 - 45)	(2.09)	_____	(34.72)	_____	(22.50)	_____	113.39	_____
48 Cash costs (10 - 27)	221.18	_____	64.73	_____	138.13	_____	276.45	_____
49 Operations costs (10 - 31)	104.47	_____	20.84	_____	64.81	_____	216.30	_____
50 All except land (47 + 44)	42.61	_____	(34.77)	_____	9.25	_____	160.74	_____

^{a/} Numbers in parenthesis are negative.

Table 12. (CONTINUED) Comparative RETURNS AND COSTS for crops, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo, 1977-78.

Line	Alfalfa, baled	Your farm	Alfalfa, cubed	Your farm	Barley for feed	Your farm	Irrigated pasture	Your farm	Potatoes	Your farm
1 Returns:										
2 Crop	Hay		Hay		Barley		Pasture		Potatoes	
3	--		--		Straw		--		--	
4 Yield/acre	4.5 tons		4.5 tons		40 cwt		8 AUM's		250 cwt	
5	--		--		.75 ton		--		--	
6 Price/unit	\$45.17 ton		\$55.17 ton		\$3 cwt		\$10 AUM		\$2 cwt	
7	--		--		\$20 ton		--		--	
8 Value/acre	\$203.26		\$248.26		\$120.00		\$ 80.00		\$500.00	
9	--		--		15.00		--		--	
10 Gross returns	\$203.26		\$248.26		\$135.00		\$ 80.00		\$500.00	
11 Operations costs:										
12 Labor @ \$4/hr	6.65		11.85		17.71		5.95		37.71	
13 Fuel	1.81		3.08		6.94		1.44		12.11	
14 Repair, lube	2.37		5.61		13.02		1.80		26.30	
15 Seed	--		--		8.00		--		102.00	
16 Fertilizer	16.60		16.60		21.24		33.84		44.80	
17 Herbicides	--		--		1.83		--		7.08	
18 Insect & fungi	--		--		--		--		20.08	
19 Nematocide	--		--		--		--		--	
20 Other material	--		--		--		--		--	
21 Custom charges	78.00		82.50		15.50		--		15.17	
22 Electricity	17.60		17.60		9.60		17.60		11.20	
23 Sprinkler repairs	3.22		3.22		3.22		3.22		3.22	
24 General overhead (cash)	6.31		7.02		4.85		3.19		13.98	
25 Subtotal	132.56		147.48		101.91		67.04		293.65	
26 Interest, 10%, 6 mo's	6.63		7.37		5.09		3.35		14.69	
27 Subtotal, cash costs	139.19		154.85		107.00		70.39		308.34	
28 Management, 5% of receipts	10.16		12.41		6.75		4.00		25.00	
29 Machinery fixed costs	5.11		11.56		27.70		4.19		67.04	
30 Alfalfa stand (op.)	14.58		14.58		--		13.22		--	
31 Subtotal, operations costs	169.04		193.40		141.45		91.80		400.38	
32 Real estate costs:										
33 Improvements:										
34 Depreciation	2.58		2.58		2.58		2.78		2.58	
35 Interest	6.49		6.49		6.49		7.49		6.49	
36 Insurance & taxes	3.83		3.83		3.83		3.93		3.83	
37 Repairs & utilities	4.40		4.40		4.40		5.40		4.40	
38 Subtotal, improvements	17.30		17.30		17.30		19.60		17.30	
39 Sprinkler system:										
40 Depreciation	20.48		20.48		20.48		20.48		20.48	
41 Interest	15.49		15.49		15.49		15.49		15.49	
42 Insurance & taxes	2.29		2.29		2.29		2.29		2.29	
43 Subtotal, sprinkler	38.26		38.26		38.26		38.26		38.26	
44 Net land rent:	--		--		--		--		49.09	
45 TOTAL COSTS (31+38+43+44)	224.60		248.96		197.01		149.66		505.03	
46 Return above: ^{a/}										
47 Total costs (10 - 45)	(21.34)		(.70)		(62.01)		(69.66)		(5.03)	
48 Cash costs (10 - 27)	64.07		93.41		28.00		9.61		191.66	
49 Operations costs (10 - 31)	34.22		54.86		(6.45)		(11.80)		99.62	
50 All except land (47 + 44)	(21.34)		(.70)		(62.01)		(69.66)		44.06	

^{a/} Numbers in parenthesis are negative.

Table 13. Summary and comparison of PHYSICAL DATA for CROPS, CENTER PIVOT SPRINKLER IRRIGATION, Southeastern, Wyo., 1977-78.

Item	Unit	Sugar beets	Corn-grain	Corn-silage	Dry beans	Alfalfa, baled	Alfalfa, cubed	Barley for feed	Irrigated pasture	Potatoes
Enterprise size	acres	125	125	62	62	62	62	62	125	375
Fertilizer:										
Nitrogen	lb. avail.	150	130	130	18	--	--	60	120	150
Phosphate	lb. avail.	100	80	80	46	80	80	40	40	135
Potassium	lb. avail.	50	--	--	--	10	10	20	20	--
Sulfer	lb. avail.	20	--	--	--	25	25	--	--	--
Zinc	lb. avail.	--	5	5	3	--	--	--	--	--
Trucks:^{b/}										
Pickups	mi/acre	35.0	26.0	26.0	28.0	22.0	22.0	22.0	20.0	30
2 ton	mi/acre	17.3	8.6	22.0	3.36	--	3.3	4.73	--	23
Tractors:^{a/}										
125 hp, diesel	hr/acre	1.654	.508	1.277	.708	--	--	.508	.091	1.417
100 hp, diesel	hr/acre	2.320	.609	1.378	.627	.200	.200	.400	--	1.241
70 hp, diesel	hr/acre	.878	.739	.739	1.239	.079	.829	.079	.079	.436
40 hp, gas	hr/acre	.544	.159	.159	.682	--	--	.629	--	--
All tractors	hr/acre	5.396	2.015	3.553	3.256	.279	1.029	1.616	.170	3.094
Labor:^{a/}										
Irrigation water	acre in.	22	16	16	16	22	22	12	22	14
Farm fuel used:^{b/}										
Diesel	gal/acre	31.59	10.39	21.08	14.59	1.65	3.97	7.16	.98	20.22
Gasoline	gal/acre	8.48	7.50	7.45	8.34	2.20	2.86	5.09	2.00	7.40
Custom fuel used:^{b/}										
Diesel	gal/acre	--	--	--	.62	10.40	6.00	1.71	--	--
Gasoline	gal/acre	.13	--	--	.50	3.75	3.75	3.97	--	2.16
Total fuel:										
Diesel	gal/acre	31.59	10.39	21.08	15.21	12.05	9.97	8.87	.98	20.22
Gasoline	gal/acre	8.61	7.50	7.45	8.84	5.95	6.61	9.06	2.00	9.56

^{a/} Hours/acre before calculating miscellaneous use. Does not include custom labor and tractor use.

^{b/} Fuel use is calculated based on miles and hours/acre as shown in crop budgets and the following use rates:

Power unit	Gallons/hour			Power unit	Gasoline
	High	Med	Low		
125 hp, diesel	8.1	6.5	5.0	Pickups, ½ ton	10 mi/gal
100 hp, diesel	7.0	5.8	4.7	Trucks, 2 ton	5 mi/gal
70 hp, diesel	4.9	3.9	3.1		
40 hp, gas	4.1	3.4	2.8	Combine	6 gal/hr
				Custom:	
				Swather	5 gal/hr
				Aerial spraying	.5 gal/acre

APPENDIX

Explanation of Worksheets

Appendix Worksheet I shows labor and machinery requirements and performance rates associated with cultural operations for crops grown under sprinkler irrigation. Basic data for this summary were provided by cooperators when they indicated operations, equipment and labor needed for each job performed on sprinkler irrigated crops.

Cooperators indicated the power unit and machine for each job and acres covered/10 hr. These data were extended to arrive at requirements in hr/acre/one time over. These coefficients are then used as "building blocks" for calculating costs for each operation in the enterprise budgets.

Appendix Worksheet II shows the inventory of depreciable assets, with size, 1977 cost, estimated useful life, in hours or miles and years until obsolete. Data for case farm machines includes: years the item has been used on the farm, remaining useful life, annual use on the case farm, and present, salvage, depreciable and average values. Depreciable value is present value minus salvage value. Average value is present value plus salvage divided by 2.

a/ Annual taxes are based on guides and estimates developed from information obtained from assessors. The author accepts the responsibility for the above guides as they may or may not be as used by assessors. Assessed values for vehicles based on age: 1 yr. 60%; 2 yr. 50%; 3 yr. 40%; 4 yr. 30%; 5 yr. 20%; 6 yr. and over 15%. Assumed levy of 68 mills.

Appendix Worksheet III shows annual and per unit fixed costs for machinery and improvements. Calculations were as follows:

$$\text{Annual depreciation} = \frac{\text{Present value minus salvage}}{\text{Years remaining life}}$$

$$\text{Interest on average investment} = \text{average value} \times 10\%$$

$$\text{Annual taxes:}^a/ \text{ Vehicles} = (\text{cost to farmer}) \times (\% \text{ of cost based on age}) \times (30 \text{ mills}) + (\text{state fee based on weight})$$

$$\text{Machinery} = (\text{average value}) \times (.15) \times (\text{mill levy})$$

$$\text{Metal shop} = (\$.08) \times (\text{sq ft floor area})$$

$$\text{Machine shed} = (\$.04) \times (\text{sq ft floor area})$$

Annual insurance = estimates provided by cooperators

$$\text{Fixed cost/unit} = \frac{\text{Annual fixed cost}}{\text{Annual use}}$$

Appendix Worksheet IV shows estimated annual and per unit operating costs for machinery and improvements. Fuel use for vehicles and tractors was based on cooperator estimates and manufacturer data. Fuel use, fuel cost, oil-lube-repair, and

total operating costs for tractors used in developing the crop budgets were as follows:

Fuel rates and cost, oil-lube-repairs and total operating cost/hr for tractors (Torrington).

Tractor fuel rates and cost/hr for various loads

Work load	125 hp diesel	100 hp diesel	70 hp diesel	40 hp gas
	<u>Fuel use, gal/hour</u>			
High	8.1	7.0	4.9	4.1
Medium	6.5	5.8	3.9	3.4
Low	5.0	4.7	3.1	2.8
	<u>Fuel cost, \$/hour^{a/}</u>			
High	3.28	2.84	1.98	2.12
Medium	2.63	2.35	1.58	1.76
Low	2.02	1.90	1.25	1.45
	<u>Oil, lube, repairs, \$/hour^{b/}</u>			
All	2.23	1.76	1.43	1.25
	<u>Total operating cost, \$/hour^{c/}</u>			
High	5.51	4.60	3.41	3.37
Medium	4.86	4.11	3.01	3.01
Low	4.25	3.66	2.68	2.70

$$\text{Operating cost/unit} = \frac{\text{Annual operating cost}}{\text{Annual use}}$$

Appendix Worksheet V shows input prices and material application rates for case farm crops. These input prices were obtained from farmers

^{a/} Diesel at 40.5 cents/gal, gasoline at 51.7 cents/gal net after refunds.

^{b/} Rates taken from Appendix Worksheet IV.

^{c/} These rates were used in budgeting costs for specific cultural operations.

and dealers and represent estimates for the 1977 crop. Spaces are provided for users to list inputs and prices for subsequent years.

A rate of \$4/hour was charged for all labor used in producing crops. Full-time employees in the area are normally paid on a monthly basis. Total earnings of farm employees would include wages and housing with utilities. Other earnings may or may not include medical insurance and meat. Cooperators indicated the labor rate of \$4/hour would just about cover cash costs for full-time farm employees in the area.

Appendix Worksheet VI shows the inventory and investments with fixed and operating costs for specialized items necessary for center pivot sprinkler irrigation. Most of the specialized investment is for a sprinkler system and potato equipment.

Investments and costs are developed for two sprinkler situations, i.e., pumping from a 100 ft. well and pumping from a surface source. Users of the budgets should note the specific investment cost items for each situation:

	<u>Investments</u>	
	<u>Pump from well</u>	<u>Pump from surface</u>
Circle sprinkler	\$20,800	\$20,800
Motor, pump, panel, etc.	8,136 (100 hp)	3,800 (75 hp)
Well (16" x 125')	3,000	---
Mainline pipe	4,012	4,012
Totals	<u>\$35,948</u>	<u>\$28,612</u>

Appendix Worksheet I. Cultural operations and machine-labor performance rates for crops under center pivot sprinklers, Southeastern, Wyo., 1977-78.

Operation (s)	Trac- tor	Imple- ment	Sugar beets	Corn- grain	Corn- silage	Alf- alfa	Dry beans	Bar- ley	Po- tatoes	Pas- ture	Acres/ 10 hrs	Hours/ acre/ 1 time over	Fuel	
													Type	Rate
Preplant:														
Rip (subsoiler)	125	3 shank	.2X	.2X	.2X	--	.2X	.2X	--	.2X	22	.454	diesel	high
Spread fertilizer	70	custom	1X	1X	1X	1X	1X	1X	1X	1X	63	.159	diesel	low
Plow & packer ^{a/}	125	4-18's	1X	1X	1X	--	1X	1X	1X	--	22	a/	diesel	high
Disk	100	15'	1X	1X	1X	--	--	--	2X	--	55	.182	diesel	high
Roller harrow	100	15'	2X	1X	1X	1X	2X	2X	--	--	50	.200	diesel	high
Level	125	14'	1X	--	--	--	--	--	--	--	50	.200	diesel	high
Shank in nematocide	100	custom	--	--	--	--	--	--	--	--	44	.227	diesel	high
Field cultivator	125	15'	--	--	--	--	1X	--	1X	--	50	.200	diesel	high
Spike harrow	40	24'	--	--	--	--	1X	--	1X	--	55	.182	gas	high
Plant:														
Sugar beets	70	6 row	1.06X	--	--	--	--	--	--	--	24	.417	diesel	high
Corn	70	4 row	--	1X	1X	--	--	--	--	--	33	.303	diesel	medium
Beans	70	6 row	--	--	--	--	1X	--	--	--	33	.303	diesel	medium
Barley	40	12'	--	--	--	--	--	1X	--	--	33	.303	gas	medium
Potatoes	125	4 row	--	--	--	--	--	--	1X	--	25	.400	diesel	high
Cut & treat seed	--	cutter	--	--	--	--	--	--	1X	--	--	--	--	--
Grow:														
Rough (stop blowing)	40	stripper	2X	--	--	--	--	--	--	--	44	.227	gas	low
Post or lay-by spray	40	sprayer	.2X	--	--	--	--	--	1X	--	44	.227	gas	low
Cultivate: 1st	70	6 or 4 R	1X	1X	1X	--	1X	--	1X	--	28	.357	diesel	low
Other	100	6 or 4 R	3X	1X	1X	--	1X	--	1X	--	44	.227	diesel	low
Rotary hoe	40	12'	--	--	--	--	--	--	--	--	66	.151	gas	low
Spray weeds	40	sprayer	--	1X	1X	--	--	1X	--	--	63	.159	gas	low
Clip	40	7 ft	--	--	--	--	--	--	--	--	40	.250	gas	low
Spray by air	--	air	.25X	--	--	1X	1X	--	3 1/3X	--	--	--	gas	.5 g/acre
Harvest:														
Top (saver)	100	6 row	1X	--	--	--	--	--	--	--	11	.909	diesel	high
Pull & load	125	3 row	1X	--	--	--	--	--	--	--	11	.909	diesel	high
Combine	--	14' SP	--	1X	--	--	1X	1X	--	--	22	.454	gas	6 g/hr
Cut & rod weeder	70	6 row	--	--	--	--	1X	--	--	--	20	.500	diesel	high
Rake beans	40	8'	--	--	--	--	1X	--	--	--	20	.500	gas	low
Chop silage	125	2 row	--	--	1X	--	--	--	--	--	13	.769	diesel	high
Pack silage	100	blade	--	--	1X	--	--	--	--	--	13	.769	diesel	medium
Swath (custom)	--	14' SP	--	--	--	3X	--	1X	--	--	40	.250	gas	5 g/hr
Bale & stack (custom)	--	custom	--	--	--	3X	--	1X	--	4.5 T/hr	--	--	diesel	medium
Windrow potatoes	100	2 row	--	--	--	--	--	--	1X	--	25	.400	diesel	medium
Harvest & load	125	2 row	--	--	--	--	--	--	1X	--	25	.400	diesel	high
Rake straw (1/2 of area)	40	low	--	--	--	--	--	1X	--	--	60	.167	gas	low
Vehicles:														
Pickups	--	1/2 ton	35	26	26	22	28	22	30	20	30 mi/hr	--	gas	10 mi/gal
Trucks: Haul seed	--	2 ton	--	--	--	--	.26	.33	1.00	--	--	--	gas	5 mi/gal
Haul crops	--	2 ton	17.3	8.6	22.0	--	3.1	4.4	22.0	--	--	--	gas	5 mi/gal

a/ Hours/acre to plow and pull packer: loam .454, sandy .417.

Appendix Worksheet II . Inventory of vehicles, tractors, implements and improvements, 400 acre farm, Torrington area, Wyo., 1977-78.

Item	Size	New equipment			Values for case farm							
		Cost 1977	Useful life Hr or mi	Total years	Years Used	Remain- ing years	Annual Use miles	Present \$	Salvage \$	Deprec- ible \$	Average \$	
Vehicles:												
Pickup #1	gas	½ ton	5,000	64,000	8	4	4	6,120	3,000	800	2,200	1,900
Pickup #2	gas	½ ton	6,000	64,000	8	2	6	6,120	4,000	1,000	3,000	2,500
Truck, bed & hoist #1	gas	2 ton	12,800	60,000	15	10	5	1,500	4,000	2,500	1,500	3,250
Truck, bed & hoist #2	gas	2 ton	12,800	60,000	15	5	10	1,500	9,000	3,000	6,000	6,000
Truck, bed & hoist #3	gas	2 ton	12,800	60,000	15	2	13	1,500	12,000	3,500	8,500	7,750
Tractors:												
2-wheel drive, duals	diesel	125 hp	27,080	12,000	10	2	8	525	18,000	7,000	11,000	12,500
2-wheel drive, duals	diesel	100 hp	23,940	12,000	10	4	6	570	12,000	5,000	7,000	8,500
2-wheel drive, duals	diesel	70 hp	15,040	12,000	12	6	6	440	6,000	1,500	4,500	3,750
2-wheel drive	gas	40 hp	11,000	12,000	12	10	2	210	1,200	600	600	900
Tillage equipment:												
Plow, 2-way		4-18's	4,300	2,500	10	2	8	182	3,600	1,080	2,520	2,340
Roller harrow		15'	4,540	2,500	10	4	6	120	2,000	600	1,400	1,300
Leveler		14'	3,000	2,500	15	2	13	107	2,000	600	1,400	1,300
Disc, tandem		15'	3,392	2,500	10	1	9	71	2,400	720	1,680	1,560
Field cultivator		15'	3,400	2,500	14	2	12	23	2,500	600	1,900	1,550
Spike tooth harrow		24'	1,200	2,500	20	5	15	50	600	200	400	400
Stripper (for beets)		6 row	450	2,500	15	10	5	27	250	100	150	175
Packer		6 ft	950	2,500	10	2	8	182	650	250	400	450
Planting equipment:												
Grain drill		12'	4,350	2,000	16	10	6	35	1,000	400	600	700
Beet planter		6 row	3,400	2,000	8	4	4	134	2,000	640	1,360	1,320
Chemical incorporator		6 row	800	2,000	8	4	4	53	400	200	200	300
Chemical boxes, 1 set		6 row	1,090	2,000	8	4	4	53	550	250	300	400
Cultivating equipment:												
Cultivators (2)		6 row	3,000	2,500	10	6	4	232	1,600	800	800	1,200
Cultivator, rolling		6 row	2,000	2,500	10	2	8	116	1,800	540	1,260	1,170
Beet roller		6 row	1,100	2,500	25	15	10	6	500	250	250	375
Rotary hoe		12'	1,650	2,500	15	8	7	42	300	165	135	232
Harvest equipment:												
Beet topper (saver)		6 row	11,500	2,000	6	2	6	110	9,000	2,500	6,500	5,750
Beet puller		3 row	18,000	2,000	6	2	6	110	12,000	4,000	8,000	8,000
Combine, SP	gas	14'	36,000	2,500	14	7	7	105	10,000	3,000	7,000	6,500
Side rake		8'	1,600	2,000	10	8	2	50	300	60	240	180
Bean cutter		6 row	1,850	2,500	15	10	5	50	500	100	400	300
Rod weeder		12'	1,200	2,500	15	10	5	50	400	80	320	240
Corn chopper		2 row	4,600	2,000	10	4	6	44	3,000	600	2,400	1,800
Miscellaneous:												
Front loader		1.5 ton	3,500	2,000	10	5	5	150	1,200	500	700	850
Ditcher		8'	800	2,500	12	6	6	56	500	150	350	325
Blade		8'	1,000	2,500	12	4	8	60	600	200	400	400
Ditch closer		8'	600	2,500	15	5	10	56	300	100	200	200
Sprayer, 250 gal		6 row	450	2,500	10	4	6		500	200	300	350
Fuel tanks (2 @ 500 gal)		500 gal	900	--	15	8	7	400	500	200	300	350
Siphon tubes (1,000)		misc.	1,627	--	10	--	10	400	1,000	500	500	750
Gated pipe (1,320 ft)		10"	2,838	--	15	4	11	340	2,000	1,500	500	1,750
Shop equipment		misc.	8,000	--	--	--	20	400	4,000	4,000	--	4,000
Totals, vehicles & equipment			<u>260,047</u>					<u>137,150</u>	<u>49,985</u>	<u>87,165</u>	<u>93,567</u>	
Improvements:												
Shop, metal		40 x 60	24,000	--	30	15	15	400	12,000	6,000	6,000	9,000
Machine shed, frame		40 x 60	9,600	--	20	10	10	400	6,000	3,000	3,000	4,500
Labor house, frame		26 x 40	24,000	--	30	15	15	400	15,000	10,000	5,000	12,500
Concrete ditch, 2 miles		14"	7,920	--	30	10	20	400	2,600	--	2,600	1,300
Labor house, beets		20 x 30	8,500	--	30	15	15	105	4,000	3,000	1,000	3,500
Totals, improvements			<u>74,020</u>					<u>39,600</u>	<u>22,000</u>	<u>17,600</u>	<u>30,800</u>	

Appendix Worksheet III Fixed costs for vehicles, tractors, implements and improvements, 400 acre farm, Torrington area, Wyo., 1977-78.

Item	Size	Annual use miles	Years			Annual costs				Fixed costs/unit			
			Used	Remain- ing	Deprec- iation	Inter- est	Taxes	Insur- ance	Total	Deprec- iation	Inter- est	Taxes & Insurance	Total
					\$/year				\$/mile				
Vehicles:													
Pickup #1	1/2 ton	6,120	4	4	550	190	60	80	880	.090	.031	.023	.144
Pickup #2	1/2 ton	6,120	2	6	500	250	100	100	950	.082	.041	.032	.155
Truck, bed & hoist #1	2 ton	1,500	10	5	300	325	78	100	803	.200	.216	.119	.535
Truck, bed & hoist #2	2 ton	1,500	5	10	600	600	120	120	1,440	.400	.400	.160	.960
Truck, bed & hoist #3	2 ton	1,500	2	13	654	775	204	150	1,783	.436	.517	.236	1.189
Tractors:													
					hours				\$/hour				
2-wheel drive, duals, diesel	125 hp	525	2	8	1,375	1,250	184	--	2,809	2.62	2.38	.35	5.35
2-wheel drive, duals, diesel	100 hp	570	4	6	1,167	850	122	--	2,139	2.05	1.49	.21	3.75
2-wheel drive, duals, diesel	70 hp	440	6	6	750	375	61	--	1,186	1.70	.85	.14	2.69
2-wheel drive gas	40 hp	210	10	2	300	90	12	--	402	1.43	.43	.05	1.91
Tillage equipment:													
Plow, 2-way	4-18's	182	2	8	315	234	24	--	573	1.73	1.29	.13	3.15
Roller harrow	15'	120	4	6	233	130	13	--	376	1.94	1.08	.11	3.13
Leveler	14'	107	2	13	108	130	13	--	251	1.01	1.21	.12	2.34
Disc, tandem	15'	71	1	9	187	156	16	--	359	2.63	2.20	.23	5.06
Field cultivator	15'	23	2	12	158	155	16	--	329	6.88	6.74	.69	14.31
Spike tooth harrow	24'	50	5	15	27	40	4	--	71	.54	.80	.08	1.42
Stripper (for beets)	6 row	27	10	5	30	17	2	--	49	1.11	.63	.07	1.81
Packer (behind plow)	6 ft	182	2	8	50	45	5	--	100	.27	.25	.03	.55
Planting equipment:													
Grain drill	12'	6	10	6	100	100	7	--	207	2.86	2.85	.20	5.91
Beet planter	6 row	134	4	4	340	132	13	--	485	2.54	.98	.10	3.62
Chemical incorporator	6 row	53	4	4	50	30	3	--	83	.94	.57	.06	1.57
Chemical boxes	6 row	53	4	4	75	40	4	--	119	1.41	.75	.08	2.24
Cultivating equipment:													
Cultivators (2)	6 row	232	6	4	200	120	12	--	332	.86	.52	.05	1.43
Cultivator, rolling	6 row	116	2	8	158	117	12	--	287	1.36	1.01	.10	2.47
Beet roller	6 row	6	15	10	25	37	4	--	66	4.17	6.17	.67	11.00
Rotary hoe	12'	42	8	7	19	23	2	--	44	.45	.55	.05	1.05
Harvest equipment:													
Beet topper (saver)	6 row	110	2	6	1,083	575	59	--	1,717	9.85	5.23	.53	15.61
Beet puller	3 row	110	2	6	1,333	800	82	--	2,215	12.12	7.27	.75	20.14
Combine SP gas	14'	105	7	7	1,000	650	66	--	1,716	9.52	6.19	.63	16.34
Side rake	8'	50	8	2	120	18	2	--	140	2.40	.36	.04	2.80
Bean cutter	6 row	50	10	5	80	30	3	--	113	1.60	.60	.06	2.26
Rod weeder	12'	50	10	5	64	24	2	--	90	1.28	.48	.04	1.80
Corn chopper	2 row	44	4	6	400	180	18	--	598	9.09	4.09	.41	13.59
Miscellaneous:													
Front loader	1.5 ton	150	5	5	140	85	9	--	234	.93	.57	.06	1.56
Ditcher	8'	56	6	6	58	32	3	--	93	1.04	.57	.05	1.66
Blade	8'	60	4	8	50	40	4	--	94	.83	.67	.07	1.57
Ditch closer	8'	56	5	10	20	20	2	--	42	.35	.36	.04	.75
Sprayer, 250 gal	6 row	32	4	6	50	35	4	--	89	1.56	1.09	.12	2.78
					acres				\$/acre				
Fuel tanks (2)	500 gal	400	8	7	43	35	4	--	82	.11	.09	.01	.21
Siphon tubes (1,000)	misc.	400	--	10	50	75	--	--	125	.12	.19	--	.31
Gated pipe (1320 ft)	10"	340	4	11	45	175	18	--	238	.13	.51	.06	.70
Shop equipment	misc.	400	--	20	--	400	41	--	441	--	1.00	.10	1.10
Totals, vehicles & equipment					12,807	9,385	1,408	550	24,150				
Improvements:													
Shop, metal	40 x 60	400	15	15	400	900	192	120	1,612	1.00	2.25	.78	4.03
Machine shed, frame	40 x 60	400	10	10	300	450	96	48	894	.75	1.12	.36	2.23
Labor house, frame	26 x 40	400	15	15	333	1,250	166	90	1,839	.83	3.12	.65	4.60
Concrete ditch, 2 miles	14"	400	10	20	130	130	--	--	260	.32	.32	--	.64
Labor house, beets	20 x 30	105	15	15	67	350	24	40	481	.64	3.33	.23	3.88
Totals, improvements					1,230	3,080	478	298	5,086				

Appendix Worksheet IV . Operating costs for vehicles, tractors, implements and improvements, 400-acre farm, Torrington area, Wyo., 1977-78.

Item	Size	Annual use miles	Years		Annual operating cost			Per unit operating costs		
			Used	Remain- ing	Fuel	Oil, lube, repairs	Total	Fuel	Oil, lube, repairs	Total
Vehicles:										
Pickup #1	1/2 ton	6,120	4	4	316	422	738	.052	.069	.121
Pickup #2	1/2 ton	6,120	2	6	316	462	778	.052	.075	.127
Truck, bed & hoist #1	2 ton	1,500	10	5	155	494	649	.103	.329	.432
Truck, bed & hoist #2	2 ton	1,500	5	10	155	524	679	.103	.349	.452
Truck, bed & hoist #3	2 ton	1,500	2	13	155	554	709	.103	.369	.472
Tractors:										
2-wheel drive, duals, diesel	125 hp	525	2	8	1,652	1,169	2,821	a/	2.23	a/
2-wheel drive, duals, diesel	100 hp	570	4	6	1,387	1,002	2,389	a/	1.76	a/
2-wheel drive, duals, diesel	70 hp	440	6	6	665	628	1,293	a/	1.43	a/
2-wheel drive, gas	40 hp	210	10	2	338	262	600	a/	1.25	a/
Tillage equipment:										
Plow, 2-way	4-18's	182	2	8	--	516	516	--	2.84	2.84
Roller harrow	15'	120	4	6	--	196	196	--	1.63	1.63
Leveler	14'	107	2	13	--	193	193	--	1.80	1.80
Disc, tandem	15'	71	1	9	--	222	222	--	3.13	3.13
Field cultivator	15'	23	2	12	--	64	64	--	2.78	2.78
Spike tooth harrow	24'	50	5	15	--	38	38	--	1.41	1.41
Stripper (for beets)	6 row	27	10	5	--	23	23	--	.85	.85
Packer (behind plow)	6'	182	2	8	--	42	42	--	.23	.23
Planting equipment:										
Grain drill	12	6	10	6	--	24	24	--	.69	.69
Beet planter	6 row	134	4	4	--	297	297	--	2.22	2.22
Chemical incorporator	6 row	53	4	4	--	53	53	--	1.00	1.00
Chemical boxes	6 row	53	4	4	--	82	82	--	1.55	1.55
Cultivating equipment:										
Cultivators (2)	6 row	232	6	4	--	447	447	--	1.93	1.93
Cultivator, rolling	6 row	116	2	8	--	73	73	--	.63	.63
Beet roller	6 row	6	15	10	--	9	9	--	1.50	1.50
Rotary hoe	12'	42	8	7	--	19	19	--	.45	.45
Harvest equipment:										
Beet topper (saver)	6 row	110	2	6	--	627	627	--	5.70	5.70
Beet puller	3 row	110	2	6	--	1,106	1,106	--	10.05	10.05
Combine, SP	14'	105	7	7	326	1,002	1,328	3.10	9.54	12.64
Side rake	8'	50	8	2	--	59	59	--	1.18	1.18
Bean cutter	6 row	50	10	5	--	131	131	--	2.62	2.62
Rod weeder	12'	50	10	5	--	55	55	--	1.10	1.10
Corn chopper	2 row	44	4	6	--	408	408	--	9.27	9.27
Miscellaneous:										
Front loader	1.5 ton	150	5	5	--	205	205	--	1.37	1.37
Ditcher	8'	56	6	6	--	20	20	--	.36	.36
Blade	8'	60	4	8	--	23	23	--	.38	.38
Ditch closer	8'	56	5	10	--	21	21	--	.37	.37
Sprayer, 250 gal.	6 row	32	4	6	--	67	67	--	2.09	2.09
Fuel tanks (2)										
Fuel tanks (2)	500 gal	400	8	7	--	12	12	--	.03	.03
Siphon tubes (1,000)	misc.	400	--	10	--	85	85	--	.21	.21
Gated pipe (1,320 ft)	10"	340	4	11	--	100	100	--	.29	.29
Shop equipment	misc.	400	--	20	--	400	400	--	1.00	1.00
Subtotals, vehicles & equipment						5,465	12,136	17,601		
Improvements:										
Shop, metal	40 x 60	400	15	15	--	500	500	--	1.25	1.25
Machine shed, frame	40 x 60	400	10	10	--	104	104	--	.26	.26
Labor house, frame	26 x 40	400	15	15	--	1,158	1,158	--	2.89	2.89
Concrete ditch, 2 miles	14"	400	10	20	--	156	156	--	.39	.39
Labor house, beets	20 x 30	105	15	15	--	221	221	--	2.10	2.10
Subtotals, improvements						2,139	2,139			

a/ See page 33 for rates of fuel use, fuel cost, oil-lube-repair and total operating costs/hr for tractors.

Appendix Worksheet V . Input prices and application rates, 400-acre farm, Torrington area, Wyo., 1977-78.

Item	Unit	1977	Application rates/acre or times over						1978	
		Price/unit	Oats seeded to alfalfa	Sugar beets	Corn-grain	Corn-silage	Alfalfa baled	Dry beans	Barley for feed	Price/unit
Fertilizer:										
Nitrogen (N)	lb avail.	.210	40	150	130	130	--	18	80	
Phosphate (P)	lb avail.	.163	40	100	80	80	80	46	40	
Potassium (K)	lb avail.	.106	20	50	--	--	10	--	20	
Sulfur (S)	lb avail.	.100	--	20	--	--	25	--	--	
Zinc (Z)	lb avail.	1.00	--	--	5	5	--	3	--	
Seed:										
Sugar beet	lb	4.15	--	2.65	--	--	--	--	--	
Feed barley (certified)	cwt	8.00	--	--	--	--	--	--	100	
Corn (med. flats)	lb	.60	--	--	20	20	--	--	--	
Alfalfa	lb	1.70	12	--	--	--	--	--	--	
Bean	cwt	23.00	--	--	--	--	--	70	--	
Oats (certified)	cwt	9.00	70	--	--	--	--	--	--	
Custom services:										
Swath	\$/acre	5.00	1X	--	--	--	3X	--	1X	
Bale (\$9), stack (\$5)	\$/ton	14.00	1X	--	--	--	3X	--	1X	
Spray for mildew (air)	\$/acre	7.00	--	.2X	--	--	--	--	--	
Spray on herbicide	\$/acre	2.50	--	--	1X	1X	--	1X	--	
Crop insurance (\$100 cover.)	\$/acre	--	15.00	19.30	12.90	12.90	--	20.70	15.00	
Shank in herbicide	\$/acre	3.50	--	--	--	--	--	--	--	
Thin beets	\$/acre	30.00	--	1X	--	--	--	--	--	
Weed, beets or beans	\$/acre	15.00	--	1.66X	--	--	--	.5X	--	
Fulltime farm labor	\$/hour	4.00	--	--	--	--	--	--	--	
Spray for mildew	\$/acre	12.00	--	.25X	--	--	--	1X	--	
Association dues	\$/ton	.06	--	1X	--	--	--	--	--	
Chemicals:										
Telon, nematocide	gal	4.20 ^{a/}	--	15 gal	--	--	--	--	--	
RoNeet, herbicide	lb	.63	--	10 lb	--	--	--	--	--	
2-4, D, herbicide	lb act.	2.44	--	--	1 lb	1 lb	--	--	.75 lb	
Treflan, herbicide	pint	3.75	--	.66 pt	--	--	--	1 pt	--	
Eptam, herbicide	quart	5.00	--	--	--	--	--	1 qt	--	
Sutan, herbicide	pint	2.00	--	--	4 pts	4 pts	--	--	--	
Post emerg. herbicide	lb act.	29.00	--	.33 lb	--	--	--	--	--	
Twine (400 bales @ 60 lb)	2 balls	12.00	1X	--	--	--	3X	--	1X	
Hoes & supplies	\$/acre	1.50	--	1X	--	--	--	--	--	
Gasoline: (gross)	\$/gal.	.574	--	--	--	--	--	--	--	
(after refunds)	\$/gal.	.517	--	--	--	--	--	--	--	
Diesel	\$/gal.	.405	--	--	--	--	--	--	--	
Oil	\$/gal	1.65	--	--	--	--	--	--	--	

^{a/} Includes custom rig.

Appendix Worksheet VI. Inventory, fixed and operating costs for specialized items necessary for center pivot sprinkler irrigated crops, Southeastern, Wyo., 1977-78.

Item	Size	Cost 1977	Useful life		Values used in enterprise budgets						
			Hr or mi hours	Total years	Years used	Remain- ing years	Annual use hours	Present \$	Salvage \$	Deprec- iable \$	Average \$
Inventory:											
Potato equipment:											
Planter	4 row	10,000	2,000	8	3	5	150	6,000	600	5,400	3,300
Elevator	40 ft	7,000	2,000	10	5	5	400	4,500	500	4,000	2,500
Seed cutter	--	5,500	1,500	8	4	4	150	3,500	350	3,150	1,925
Front loader (SP, small)	½ ton	9,000	12,000	15	5	10	300	6,000	1,000	5,000	3,500
Boxes for trucks	16 ft	3,000	--	12	5	7	250	2,400	600	1,800	1,500
Windrower (potato)	2 row	7,000	1,200	6	3	3	200	5,000	1,000	4,000	3,000
Harvester	2 row	19,000	1,200	6	2	4	200	14,000	3,500	10,500	8,750
Subsoiler	5 shank	1,800	2,000	14	6	8	60	1,200	120	1,080	660
Irrigation equipment:											
Sprinkler & pivot	125 acre	26,000	--	15	5	10	125	20,800	4,160	16,640	12,480
Motor, pump, panel, cable, hookup	75 hp	4,750	--	15	5	10	125	3,800	1,140	2,660	2,470
Motor, pump, panel, cable, hookup	100 hp	10,170	--	15	5	10	125	8,136	2,441	5,695	5,288
Well (16" case)	125' @ \$30	3,750	--	20	5	15	125	3,000	600	2,400	1,800
Mainline pipe, 1,320 ft	10" @ \$3.80	5,016	--	20	5	15	125	4,012	1,605	2,497	2,808
Fixed costs:											
	Annual use	Remain- ing	Annual fixed costs				Fixed cost/unit of use				
	hours	years	Deprec- iation	Inter- est	Taxes	In- surance	Total	Deprec- iation	Inter- est	Taxes & insurance	Total
			\$/year				\$/hour				
Potato equipment:											
Planter	150	5	1,080	330	34	--	1,444	7.20	2.20	.23	9.63
Elevator	400	5	800	250	26	--	1,076	2.00	.63	.06	2.69
Seed cutter	150	4	787	193	20	--	1,000	5.25	1.29	.13	6.67
Front loader (SP, small)	300	10	500	350	36	--	886	1.67	1.16	.12	2.95
Boxes for trucks	250	7	257	150	15	--	422	1.03	.60	.06	1.69
Windrower (potato)	200	3	1,333	300	31	--	1,664	6.67	1.50	.15	8.32
Harvester	250	4	2,625	875	89	--	3,589	13.12	4.38	.44	17.94
Subsoiler	60	6	135	66	7	--	208	2.25	1.10	.12	3.47
Irrigation equipment:	acres										
Circle sprinkler	125	10	1,664	1,248	125	75	3,112	13.31	9.98	1.60	24.89
Motor, pump, 75 hp	125	10	266	247	25	15	553	2.13	1.97	.32	4.42
Motor, pump, 100 hp	125	10	570	229	54	32	885	4.56	1.83	.69	7.08
Well (12" case)	125	15	160	180	--	--	340	1.28	1.44	--	2.72
Mainline pipe 1,320 ft	125	15	166	280	--	--	446	1.33	2.24	--	3.57
Operating costs:											
	Annual use	Remain- ing	Annual operating costs				Operating cost/unit of use				
	hours	years	Fuel	Oil, lube, repair	Total	Fuel	Oil, lube, repair	Total	Fuel	Oil, lube, repair	Total
			\$/year				\$/hour				
Potato equipment:											
Planter	150	5	--	335	335	--	--	2.23	--	--	2.23
Elevator	400	5	--	703	703	--	--	1.76	--	--	1.76
Seed cutter	150	4	--	503	503	--	--	3.35	--	--	3.35
Front loader (SP small)	300	10	365	340	705	1.22	1.13	2.35	--	--	2.35
Boxes for trucks	250	7	--	179	179	--	--	.72	--	--	.72
Windrower (potato)	200	3	--	478	478	--	--	2.39	--	--	2.39
Harvester	250	4	--	1,380	1,380	--	--	6.90	--	--	6.90
Subsoiler	60	6	--	32	32	--	--	.53	--	--	.53
Irrigation equipment:	acres										
Circle sprinkler	125	10	--	582	582	--	--	4.66	--	--	4.66
Motor, pump, 75 hp	125	10	\$.65/A in	49	49	--	--	.39	--	--	.39
Motor, pump, 100 hp	125	10	\$.80/A in	105	105	--	--	.84	--	--	.84
Well (12" case)	125	15	--	--	--	--	--	--	--	--	--
Mainline pipe	125	15	--	--	--	--	--	--	--	--	--

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