Big Horn Basin Farms

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Big Horn Basin Farms is representative of an irrigated farming operation in the Big Horn Basin of Wyoming. Malting barley, sugar beets, alfalfa, and corn are the four crops grown on this farm. Production practices, costs of production, market prices, production yields, and other information are based on data from the region in order to provide a realistic setting. The probabilities of risk events were also calculated using actual data where available. Slight modifications were sometimes made to maintain the workability and realism of the scenario.

The farm includes 800 irrigated acres and 80 acres of roadways, fence lines, and farmsteads. The farm produces 265 acres of malting barley annually along with 250 acres of sugar beets, 180 acres of corn, and 105 acres of alfalfa. The irrigated acres are valued at $1,000 per acre while the other land is valued at $300 per acre. One-half of the irrigated acres are leased. Total value of the land owned by the operation is $424,000. The farm holds a 70 percent equity position in the land that it owns. The remaining 30 percent is borrowed at a fixed long-term rate of 8.0 percent.

Production costs for the four enterprises include direct cash costs to the operation excluding factor payments to land. These costs include the cash labor, maintenance and replacement costs associated with a typical operation of this size. In a typical year, half of the corn acres are harvested for silage and half are harvested for grain with yields of 23 tons/acre and 140 bushels/acre, respectively. Average expected yields for the other three enterprises are 110 bushels/acre (Malt Barley), 22 tons/acre (Sugar Beets), and 5 tons/acre (Alfalfa). In addition, the barley ground yields 0.5 tons of barley straw per year valued at $50 per ton.

Leased land is rented on a crop share basis. For malt barley, corn, and alfalfa, a one-third share of the gross revenue is paid to the landowner. In

Malt Barley Production

Crop Acres	265
Average Annual Yield	110 Bushels per Acre
Production Costs	$222.04 per Acre
Average Market Price	$2.83 per Bushel
Average Yearly Production	29,150 Bushels
Barley Straw Production	0.5 tons per Acre
Barley Straw Price	$50 per Ton
Annual Government Payment	$4,956

Sugar Beet Production

Crop Acres	250
Average Annual Yield	22 Tons per Acre
Production Costs	$506.97 per Acre
Average Market Price	$39.79 per Ton
Average Yearly Production	5,500 Tons

Irrigated Corn Production

Crop Acres	180
Average Annual Grain Yield	140 Bushels per Acre
Average Annual Silage Yield	23 Tons per Acre
Production Costs	$394.74 per Acre
Average Grain Market Price	$2.46 per Bushel
Average Silage Market Price	$20 per Ton
Average Annual Grain Production	12,600 Bushels
Average Annual Silage Production	2,070 Tons
Annual Government Payment	$8,330

Alfalfa Production

Crop Acres	105
Average Annual Hay Yield	5 tons per Acre
Production Costs	$292.56 per Acre
Average Hay Market Price	$72.11 per ton
Average Annual Hay Production	525 Tons

return, the landowner pays for one-third of the fertilizer and crop insurance expense for the crop and one-half of the chemical cost for weed control. For sugar beets, a one-fifth share of the gross revenue is paid to the landowner with the landowner paying one-fifth of the fertilizer and crop insurance expenses along with one-half of the chemical cost for weed control. The landowner is also responsible for the ownership costs associated with the land, buildings, and irrigation systems, as well as all irrigation water cost.

Labor is provided by the operator and one 12-month employee and one 8-month employee. Some part-time labor may be used on the farm for labor-intensive operations such as harvest. Operating labor is valued at $7.33 per hour plus payroll taxes.

Each year, the farm makes decisions about: 1) the type of crop insurance to buy and the coverage level to purchase; 2) when to plant sugar beets (given the risk of a late frost); 3) the level of nitrogen fertilizer to apply; and 4) whether or not to store production into the following year.

Taking all of the above information into account, the farm expects to sell 29,150 bushels of malt barley, 133 tons of barley straw, 12,600 bushels of corn, 2,070 tons of silage, and 525 ton of alfalfa hay each year with 1/6 (1/3 share on 50% of the land) of these revenues being paid to landowners. In addition, the farm expects to sell 5,500 tons of sugar beets with 1/10 (1/5 share of 50% of the land) of that revenue being paid to landowners. The farm's share of the government payments totals $13,286 resulting in total revenues to the farm of $376,391.

Expected cropping expenses net of the expenses paid by the landowners on the rented ground would total $272,032. Other expenses including interest expense, land taxes, depreciation, (non-crop) insurance, management labor, and general overhead totals $100,653 for farm. Total expenses would total $372,685 leaving a total return to land of $3,706.

Expected Annual Net Farm Income

Expected Revenues				Expected Expenses			
Malt Barley	29,150 bushels	=	$82,495	Malt Barley	265 Acres	=	$58,841
Barley Straw	133 tons	=	$6,625	Sugar Beets	250 Acres	=	$126,743
Sugar Beets	5,500 tons	=	$218,845	Irrigated Corn	180 Acres	=	$71,052
Corn Grain	12,600 bushels	=	$30,996	Alfalfa Hay	105 Acres	=	$30,719
Corn Silage	2,070 tons	=	$41,400				
Alfalfa Hay	525 tons	=	$37,858				
Lease Payments to Others		=	($55,113)	Expenses Paid by Landlords		=	($15,322)
Government Payments		=	$13,286	Other Expenses (Dep., Int., etc.)		=	$100,653
Annual Total Revenue:			$376,391	Annual Total Expenses:			$372,685

Return to Land = $3,706

DECISIONS

YEAR 1

Period 1	Risk and Probability of Occurrence	Impact
October To February	U.S. Planted Corn Acres Report Low Normal High	• Expect corn and barley prices to increase if the crop planting acreage report indicates low corn acres. • Expect corn and barley prices to decrease if the crop planting acreage report indicates high corn acres • Expect corn and barley prices to decrease if the crop planting acreage report indicates high corn acres.
	Risk Management Strategy Decisions	
	Decision 1: Barley Fertilization Choose the type and level of fertilization for your barley crop. Decision 2: Choose the type of insurance and level of coverage for your barley crop.	
Period 2	**Risk and Probability of Occurrence**	**Impact**
March To May	U.S. Barley Crop Condition Report Poor Crop Condition Average Crop Condition Excellent Crop Condition ********** Nitrogen Application Risk Too much applied Correct amount applied Too little applied	• Expect barley prices to increase in the U.S. crop report indicates poor crop condition. • Expect barley prices to decrease in the U.S. crop report indicates excellent crop condition. ********** • If too much nitrogen is applied for the resulting growing conditions, expect fertilizer impacts on yields to decline. • If the correct amount of nitrogen fertilizer is applied for growing conditions, expect fertilizer impacts on yields to be normal. • If too little nitrogen is applied for the resulting growing conditions, expect fertilizer impacts on yields to decline and for crop quality to also decline.
	Risk Management Strategy Decisions	
	Decision 1: Beet Fertilization Choose the type and level of fertilization for you sugar beet crop. Decision 2: Beet Insurance Choose the type of insurance and level of coverage for your sugar beet crop.	
Period 3	**Risk and Probability of Occurrence**	**Impact**
June	Risk of a late freeze Late freeze No late freeze	• Unless you choose to replant, a late freeze will reduce the stand and yield of the sugar beet crop. A replanted stand will show a reduced yield but less so than if you didn't replant.
	Risk Management Strategy Decisions	
	Decision 1: Beet Replant Option If a late freeze occurs, you may either replant the sugar beet crop or keep the existing stand through until harvest.	

Period 4	Risk and Probability of Occurrence	Impact
July To October	Irrigation Water Severe irrigation water shortage Moderate irrigation water shortage No irrigation water shortage Irrigation water surplus ********** Hail Severe hail Moderate hail No hail	• Expect a severe irrigation water shortage to reduce yield on all crops. • Expect a moderate irrigation water shortage to reduce yields on sugar beets and barley. ********** • Expect severe hail to significantly reduce yield on all crops. • Expect moderate hail to reduce barley yield.
	Risk Management Strategy Decisions	
	Decision 1: Sell or Store Barley You have the option to hold your barley crop until the end of the year and sell it on the cash market at that time or sell it harvest.	

YEAR 2

Period 5	Risk and Probability of Occurrence	Impact
October To February	Same as year 1.	Same as year 1.
	Risk Management Strategy Decisions	
	Same as year 1.	

Period 6	Risk and Probability of Occurrence	Impact
March To May	Same as year 1.	Same as year 1.
	Risk Management Strategy Decisions	
	Same as year 1.	

Period 7	Risk and Probability of Occurrence	Impact
June	Same as year 1.	Same as year 1.
	Risk Management Strategy Decisions	
	Same as year 1.	

Period 8	Risk and Probability of Occurrence	Impact
July To October	Same as year 1.	Same as year 1.
	Risk Management Strategy Decisions	
	Same as year 1.	
	Game End	

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