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	<p>2002 COST OF PRODUCING DRY BEANS, SWEET CORN AND GREEN PEAS UNDER CENTER PIVOT IRRIGATION IN THE COLUMBIA BASIN OF WASHINGTON STATE</p>	
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<p>COOPERATIVE EXTENSION WASHINGTON STATE  UNIVERSITY</p>		

#### NOTE

Enterprise costs and returns vary from one farm to the next and over time for any particular farm. Variability stems from differences in:

- Capital, labor, land, and management resources
- Type and size of machinery complement
- Cultural practices
- Size of farm and enterprise
- Crop yields
- Input prices
- Commodity prices

Costs can also be calculated differently depending on the intended use of the cost estimate. The information in this publication serves as a general guide for dry beans, sweet corn and green peas grown on a modern, well-managed Columbia Basin farm. To avoid drawing unwarranted conclusions, the reader must closely examine the assumptions used. If they are not appropriate for the situation at hand, adjust the costs and/or returns.

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# 2002 COST OF PRODUCING DRY BEANS, SWEET CORN AND GREEN PEAS UNDER CENTER PIVOT IRRIGATION IN THE COLUMBIA BASIN OF WASHINGTON STATE

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## INTRODUCTION

The enterprise budgets presented in this publication are based on dry beans, sweet corn and green peas produced in the Bureau of Reclamation's Columbia Basin Project. The project area is in the "big bend" of the Columbia River in south central Washington. Rainfall ranges from 6 to 10 inches annually; thus, crops depend on irrigation water pumped from behind the Grand Coulee Dam. Irrigation water availability, coupled with a growing season of 140 to 200 days, makes it possible to grow numerous crops.

Dry edible beans were ranked 33<sup>rd</sup> in value among agricultural commodities produced in Washington in 2000. In 2000, dry edible beans earned 11.5 million dollars, 12.2% less than 1999. Harvested acreage of dry edible beans was 32,000 acres in 2000. Of this acreage, 10,500 acres produced pinto beans yielding 242,000 cwt.<sup>2</sup>

Sweet corn ranked 13<sup>th</sup> in value among agricultural commodities produced in Washington in 2000. The value of production for sweet corn was 70 million dollars, an increase of 9.6% over 1999. Total acreage was 101,100 acres. Of this total 2,500 acres were used for fresh sweet corn and 98,600 acres were used for processing.<sup>2</sup>

Green peas ranked 28<sup>th</sup> in terms of value of agricultural commodities produced in the state of Washington in 2000. The value of production for green peas was approximately 24.5 million dollars, an increase of 9.1% over 1999. There were 49,100 acres of green peas planted in 2000.<sup>2</sup>

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<sup>2</sup>Washington Agricultural Statistics 2001.

The general objective of this study was to develop enterprise budgets for dry beans, sweet corn and green peas. The specific objectives are:

1. To identify production practices representative of well-managed crop enterprises grown under center pivot irrigation in the Columbia Basin.
2. To provide estimates of capital requirements, production costs and returns.
3. To provide current and prospective producers with a procedure for analyzing the profitability of various crop enterprises.

### SOURCES OF INFORMATION

The primary information for the study was obtained from a group of Columbia Basin producers. These producers were considered representative of well managed farms. Their production practices and requirements for labor, equipment, and supplies are the basis for the assumptions used in this study and represent what this group of producers consider to be the latest developments. Local farm suppliers provided price information on materials and other services commonly used by farmers. Machinery costs were based on current purchase prices and rates of annual use considered typical by the producer committee.

### BUDGET ASSUMPTIONS

The following assumptions were made in developing these enterprise budgets:

1. The enterprise budgets are for crops grown under one or more 125-acre center pivot irrigation system.
2. Land is rented for \$200 per acre.
3. The landowner furnishes the center pivot system and the operator pays the irrigation charge amounting to \$40 per acre, along with annual repairs of about \$20 per acre per year. The operator also pays the irrigation power charge estimated to be \$18 to \$20 per acre for project water, and \$60 to \$70 per acre for well water. These power costs vary throughout the Columbia Basin. For this study an irrigation power charge of \$65 per acre was used.

4. Estimated annual yield per acre for the crop enterprises are:
 

Dry (Pinto) Beans	22.0 Cwt.
Sweet Corn	9.00 Tons
Green Peas	3.25 Tons
5. Machine cost figures reflect the use of modern equipment and technologies.
6. The interest rate on operation costs and on average investment is 9%.

### DISCUSSION OF BUDGET INFORMATION

The budget information for dry beans, sweet corn and green peas is reported in a set of five tables for each crop. These three sets of tables are followed by three tables which provide machinery complement and input price data relevant to all three crops. Tables 1 through 5, for each of the three crops, are denoted by "DB" for dry beans, "SC" for sweet corn and "GP" for green peas. A summary of the information in each table follows.

#### Table 1. Schedule of Operations and Costs per Acre

Table 1 outlines the schedule of field operations by month, the type of machinery and labor used, the hours of machine use and labor use per acre, and total production costs.

Production costs are divided into two categories: (1) fixed costs, which include machinery ownership, land costs, and management; and (2) variable costs, which are associated with operating machinery, hiring labor, and purchasing services and materials. Total cost is the sum of fixed and variable costs.

Machinery fixed costs (depreciation, interest on the investment, property taxes, insurance, and housing costs) are incurred whether or not a crop is grown and do not vary with the size of the enterprise, given the ownership of a specific machinery complement. Machinery fixed costs for a specific field operation are determined by multiplying the machine hours per acre times the per-hour fixed cost. The per-hour fixed costs, shown in Table 7, are determined by dividing the total annual fixed cost by the annual hours of machinery use over all enterprises for the representative farm.

Land fixed cost is equal to the cash rent typical of the area. Much of the land used for production is rented. Even if a farmer was to produce a crop on owned land, the prevailing



#### Table 4. Break-Even Selling Prices per Unit Produced

Table 4 presents four selling price levels needed for different levels of cost recovery for producing a crop.

The first break-even price is that necessary to cover total variable costs—those costs that occur only if the crop is produced. If the price is below this level, the crop is uneconomic to produce, even in the short run, because the added costs of production are greater than the added returns.

The second break-even price is that price necessary to cover total cash costs, including land rent. If the land is owned, its rental value would not be listed as a cash cost, but as an opportunity cost as previously discussed. This price may be viewed as that price necessary to survive in the short run.

The third break-even price is the price required to cover total cash cost plus depreciation on machinery. This price allows the producer to stay in business over the long run. However, when farmers fail to include the opportunity costs associated with the investment in land and machinery when calculating their total cost break-even price, they are overstating the profitability of farming relative to alternative uses of their own resources.

The fourth break-even price is the price the owner-operator must receive to cover all out-of-pocket expenses, plus realize a fair return to labor, operating capital, and equity capital invested in land and machinery. At prices below this level the owner-operator will not earn a return on labor and capital contributions equivalent to that assumed for this study. Realization of a price above this break-even level means that in addition to covering all cash and opportunity costs, the operator will get a return to the risk taken in producing the crop.

#### Table 5. Break-Even Selling Price per Unit Produced at Different Yield Levels

Table 5 is a summary of prices producers would need to receive at different yield levels if they were to break even by covering all cash and opportunity costs.

#### Table 6. Machinery Complement

Table 6 identifies the machinery complement used to derive machinery costs. It includes the type of machines used on the representative farm, their current replacement value (new or



used), years of use before trade-in, salvage value at trade-in, annual repair cost and annual hours of use.

#### Table 7. Hourly Machinery Costs

The data in Table 6 are used to estimate per-hour fixed and variable costs appearing in Table 7. Machinery fixed costs include depreciation and interest on investment, property taxes, and insurance—costs that do not vary with the crop grown or the number of acres produced. Current replacement costs are used for all machinery and equipment. While this assumption may result in an overstatement of production costs, it is an indication of the enterprise's ability to generate the earnings needed to replace depreciable assets. Continuing increases in prices paid for machinery and equipment mean that depreciation claimed on assets purchased before price advances understates the amount of capital currently required to replace assets. When an enterprise is evaluated to determine its long-run viability, it is important to consider its ability to replace depreciable assets. Note that interest on investment represents a 9% opportunity cost to the enterprise. These are earnings foregone by investing money in the machinery complement rather than the next best alternative. This may also represent the interest paid on funds borrowed to finance machinery purchases.

Machinery variable costs include machine repair, fuel, and lubrication—costs that vary with the crop grown or the number of acres of crop produced.

#### Table 8. Input Prices

Prices used for fuel, fertilizer, chemicals, seed, custom services, and other inputs are listed in Table 8.

TABLE 1DB. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING **DRY (PINTO) BEANS** FOLLOWING CORN UNDER CENTER PIVOT IRRIGATION IN THE COLUMBIA BASIN OF WASHINGTON STATE.

OPERATION	TOOLING	MTH YEAR	MACH HOURS	LABOR HOURS	TOTAL FIXED COST	VARIABLE COST					TOTAL VARIABLE COST	TOTAL COST
						FUEL, LUBE, & REPAIRS	LABOR	SERVICE MATER.	INTER.			
						\$	\$	\$	\$	\$	\$	\$
SUBSOIL & PACK	250HP-WT, 12'SUBSOIL/13'PACK	FALL 2001	.22	.24	5.79	4.30	2.93	.00	.00	.60	7.83	13.62
SOIL TEST	CUSTOM HIRED	MAR 2002	.00	.00	.00	.00	.00	.60	.00	.03	.63	.63
DISK & PACK	250HP-WT, 20'DISK & PACKER	APR 2002	.13	.14	4.14	2.71	1.65	.00	.00	.20	4.56	8.70
PREPARE SEED BED	150HP-WT, 8R BEDDER	APR 2002	.14	.16	3.37	1.78	1.89	.00	.00	.17	3.83	7.20
FERT. & HERB.	250HP-WT, 8R BAND-TILLER	APR 2002	.25	.33	10.57	5.25	3.99	.00	56.21	2.94	68.40	78.98
SEED	150HP-WT, 8R PLANTER	MAY 2002	.25	.33	9.78	5.12	3.99	.00	40.00	1.84	50.95	60.74
IRRIGATE	IRRIGATION	SEA 2002	.00	.85	.00	.00	13.60	125.00	.00	6.24	144.84	144.84
CULT. & FERT.	150HP-WT,8R CULTIVATOR	JUN 2002	.25	.33	6.79	3.26	3.99	.00	17.25	.74	25.24	32.03
INSECT CONTROL*	CUSTOM AERIAL APPLICATION	JUL 2002	.00	.00	.00	.00	.00	6.00	9.05	.34	15.39	15.39
CUT & WINDROW	CUSTOM	AUG 2002	.00	.00	.00	.00	.00	30.00	.00	.45	30.45	30.45
HARVEST	CUSTOM COMBINE	SEP 2002	.00	.00	.00	.00	.00	45.00	.00	.34	45.34	45.34
HAUL	CUSTOM HAUL	SEP 2002	.00	.00	.00	.00	.00	9.35	.00	.07	9.42	9.42
DISK & PACK	250HP-WT, 20' DISK & PACKER	SEP 2002	.13	.14	4.14	2.71	1.65	.00	.00	.03	4.40	8.53
PICKUP	MANAGER'S PICKUP	ANN 2002	.80	.00	5.16	2.83	.00	.00	.00	.13	2.95	8.11
PICKUP	LABOR'S PICKUP	ANN 2002	.40	.00	2.73	1.79	.00	.00	.00	.08	1.87	4.60
LAND COST	LAND COSTS	ANN 2002	.00	.00	200.00	.00	.00	.00	.00	.00	.00	200.00
OVERHEAD	UTILITIES, LEGAL, ACCTG & ETC.	ANN 2002	.00	.00	.00	.00	.00	20.81	.00	.00	20.81	20.81
MANAGEMENT	COST OF MANAGEMENT	ANN 2002	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00
TOTAL PER ACRE			2.57	2.52	302.44	29.76	33.69	236.76	122.51	14.19	436.91	739.35

\* PINTO BEANS TYPICALLY REQUIRED NO MORE THAN ONE INSECTICIDE SPRAY. COLORED BEANS WILL MOST LIKELY REQUIRE TWO INSECTICIDE SPRAYS.

NOTE: ADDITIONAL COSTS MAY BE INCURRED IF CONTROL OF WHITE MOLD AND/OR SPIDER MITES BECOMES NECESSARY.

BREAK-EVEN PRICE @ A YIELD OF 22 CWT. IS \$33.61/CWT.

TABLE 2DB. MATERIALS AND SERVICES USED BY OPERATION FOR PRODUCING **DRY (PINTO) BEANS** UNDER CENTER PIVOT IRRIGATION.

OPERATION	MONTH	MATERIAL AND/OR SERVICE
SOIL TEST	MARCH	CUSTOM HIRED @ \$0.60/ACRE
FERTILIZE/HERBICIDE	APRIL	40 LBS. NITROGEN (LIQ) @ \$0.285/LB. 40 LBS. PHOSPHATE (LIQ) @ \$0.34/LB. 40 LBS. POTASH (LIQ) @ \$0.284/LB. 5 LBS. ZINC (LIQ) @ \$1.43/LB. 1.5 PINTS SONALAN @ \$3.97/PINT 1.5 PINTS EPTC @ \$4.50/PINT
PLANT	MAY	\$40/ACRE SEED COST
IRRIGATE	SEASONAL	IRRIGATION CHARGE @ \$40.00/ACRE IRRIGATION POWER @ \$65.00/ACRE IRRIGATION REPAIR @ \$20.00/ACRE
CULTIVATE/FERTILIZE	JUNE	14 GALS. SOLUTION 32 @ \$0.125/PINT .5 GAL. HUMIC ACID @ \$0.8125/PINT
INSECTICIDE*	JULY	CUSTOM AERIAL @ \$6.00/ACRE 1 PINT DIMETHOATE @ \$5.05/PINT FOLIAR NUTRIENT @ \$4.00/ACRE
CUT & WINDROW	AUGUST	CUSTOM CUT & WINDROW @ \$30.00/ACRE
HARVEST	SEPTEMBER	CUSTOM COMBINE @ \$45.00/ACRE
HAUL	SEPTEMBER	CUSTOM HAUL 1.1 TONS/ACRE @ \$8.50/TON
OVERHEAD	ANNUAL	5% OF VARIABLE COST

\*IF A SECOND INSECTICIDE IS REQUIRED, THE APPLICATION IS THE SAME EXCEPT THAT FOLIAR NUTRIENT COST WILL DECREASE TO ABOUT \$3.00 PER ACRE.

TABLE 3DB. ITEMIZED COST PER ACRE FOR PRODUCING **DRY (PINTO) BEANS**  
 FOLLOWING CORN UNDER CENTER PIVOT IRRIGATION IN THE  
 COLUMBIA BASIN OF WASHINGTON STATE.

		PRICE OR		VALUE OR	YOUR
	UNIT	COST/UNIT	QUANTITY	COST	FARM
-----					
VARIABLE COSTS		\$		\$	
SOIL TEST	ACRE	.60	1.00	.60	_____
DRY BEAN SEED	ACRE	40.00	1.00	40.00	_____
NITROGEN (LIQ)	LB.	.28	40.00	11.40	_____
PHOSPHATE (LIQ)	LB.	.34	40.00	13.60	_____
POTASH (LIQ)	LB.	.28	40.00	11.36	_____
ZINC (LIQ)	LB.	1.43	5.00	7.15	_____
SONALAN	PINT	3.97	1.50	5.96	_____
EPTC	PINT	4.50	1.50	6.75	_____
SOLUTION 32	PINT	.125	112.00	14.00	_____
HUMIC ACID	PINT	.813	4.00	3.25	_____
DIMETHOATE	PINT	5.05	1.00	5.05	_____
FOLIAR NUTRIENT	ACRE	4.00	1.00	4.00	_____
AERIAL APPLICATION	ACRE	6.00	1.00	6.00	_____
CUSTOM CUT	ACRE	30.00	1.00	30.00	_____
CUSTOM COMBINE	ACRE	45.00	1.00	45.00	_____
CUSTOM HAUL	TON	8.50	1.10	9.35	_____
GENERAL LABOR	HOUR	12.00	1.67	20.09	_____
IRRIGATION LABOR	HOUR	16.00	.85	13.60	_____
IRRIGATION WATER	ACRE	40.00	1.00	40.00	_____
IRRIGATION POWER	ACRE	65.00	1.00	65.00	_____
IRRIGATION REPAIR	ACRE	20.00	1.00	20.00	_____
TRACTOR REPAIR	ACRE	5.66	1.00	5.66	_____
TRACTOR FUEL/LUBE	ACRE	10.04	1.00	10.04	_____
MACHINERY REPAIRS	ACRE	10.21	1.00	10.21	_____
MACHINE FUEL/LUBE	ACRE	3.86	1.00	3.86	_____
INTEREST ON OP. CAP.	ACRE	14.19	1.00	14.19	_____
OVERHEAD	ACRE	20.81	1.00	20.81	_____
				-----	
TOTAL VARIABLE COST				436.91	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	11.05	1.00	11.05	_____
TRACTOR INTEREST	ACRE	10.56	1.00	10.56	_____
TRACTOR INSURANCE	ACRE	.70	1.00	.70	_____
TRACTOR TAXES	ACRE	2.11	1.00	2.11	_____
TRACTOR HOUSING	ACRE	1.17	1.00	1.17	_____
MACHINE DEPRECIATION	ACRE	14.59	1.00	14.59	_____
MACHINE INTEREST	ACRE	8.90	1.00	8.90	_____
MACHINE INSURANCE	ACRE	.59	1.00	.59	_____
MACHINE TAXES	ACRE	1.78	1.00	1.78	_____
MACHINE HOUSING	ACRE	.99	1.00	.99	_____
LAND RENT	ACRE	200.00	1.00	200.00	_____
MANAGEMENT	ACRE	50.00	1.00	50.00	_____
				-----	
TOTAL FIXED COST				302.44	_____
TOTAL COST				739.35	_____
-----					

TABLE 4DB. BREAK-EVEN SELLING PRICE PER CWT OF **DRY (PINTO) BEANS** PRODUCED IN THE COLUMBIA BASIN UNDER CENTER PIVOT IRRIGATION.

	COST PER ACRE	YOUR FARM	BREAK-EVEN PRICE (\$/CWT)	YOUR FARM
	\$	\$	(22 CWT)	\$
1. TOTAL VARIABLE COST	436.91	_____	19.86	_____
PLUS: TRACTOR & MACHINERY INSURANCE	1.29	_____		
TRACTOR & MACHINERY TAXES	3.89	_____		
LAND RENT	200.00	_____		
2. TOTAL CASH COSTS	642.09	_____	29.19	_____
PLUS: TRACTOR & MACHINERY DEPRECIATION	25.64	_____		
3. TOTAL CASH COST & DEPRECIATION	667.73	_____	30.35	_____
PLUS: TRACTOR & MACHINERY INTEREST	19.46	_____		
TRACTOR & MACHINERY HOUSING	2.16	_____		
MANAGEMENT	50.00	_____		
4. TOTAL COST	739.35	_____	33.61	_____

TABLE 5DB. BREAK-EVEN SELLING PRICE PER CWT OF **DRY (PINTO) BEANS** PRODUCED AT DIFFERENT YIELD LEVELS.

YIELD LEVEL (CWT/ACRE)	BREAK-EVEN PRICE (\$/CWT)
20	36.92
21	35.19
22	33.61
23	32.16
24	30.84
25	29.63

TABLE 1SC. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING **SWEET CORN** FOLLOWING WHEAT UNDER CENTER PIVOT IRRIGATION IN THE COLUMBIA BASIN, WASHINGTON STATE.

OPERATION	TOOLING	MTH	YEAR	MACH HOURS	LABOR HOURS	VARIABLE COST						TOTAL VARIABLE COST	TOTAL COST							
						TOTAL FIXED COST	FUEL, LUBE, & REPAIRS	LABOR	SERVICE	MATER.	INTER.									
													\$	\$	\$	\$	\$	\$	\$	\$
CHISEL PLOW*	250HP-WT, 13' CHISEL PLOW	FALL	2001	.14	.16	3.48	2.05	1.89	.00	.00	.32	4.26	7.75							
SOIL TEST	CUSTOM HIRED	MAR	2002	.00	.00	.00	.00	.00	.60	.00	.03	.63	.63							
HERBICIDE**	CUSTOM APPLIED	APR	2002	.00	.00	.00	.00	.00	6.25	6.56	.58	13.39	13.39							
DISC & PACK	250HP-WT, 20' DISK & PACK	MAY	2002	.13	.14	4.14	2.71	1.65	.00	.00	.16	4.53	8.66							
PLANT/FERTILIZE	150HP-WT, 8R-AIR PLT W/LIQ APP	MAY	2002	.13	.17	5.47	2.94	2.00	.00	91.73	3.62	100.29	105.76							
HERBICIDE	CUSTOM APPLIED	MAY	2002	.00	.00	.00	.00	.00	6.25	16.88	.87	23.99	23.99							
IRRIGATE	CENTER PIVOT	SEA	2002	.00	.85	.00	.00	13.60	125.00	.00	6.24	144.84	144.84							
NITROGATE	THROUGH IRRIGATION SYSTEM	SEA	2002	.00	.00	.00	.00	.00	.00	48.45	2.18	50.63	50.63							
CULTIVATE	150HP-WT, 8R-CULTIVATOR	JUN	2002	.13	.14	3.39	1.63	1.65	.00	.00	.10	3.38	6.77							
RESERVOIR TILLAG	250HP-WT, 8R-RESERVOIR TILLER	JUN	2002	.13	.14	4.00	2.77	1.65	.00	.00	.13	4.56	8.56							
INSECT. 2X***	CUSTOM AERIAL	SEA	2002	.00	.00	.00	.00	.00	6.00	4.70	.48	11.18	11.18							
DISK & PACK	250HP-WT, 20' DISK & PACK	AUG	2002	.13	.14	4.14	2.71	1.65	.00	.00	.07	4.43	8.56							
TOPPING***	CUSTOM HIRED	AUG	2002	.00	.00	.00	.00	.00	5.00	.00	.08	5.08	5.08							
HARVEST & HAUL	PROVIDED BY PROCESSOR	AUG	2002	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00							
SHRED STUBBLE	150HP-WT, 20' SHEDDER	AUG	2002	.17	.18	5.47	2.55	2.20	.00	.00	.07	4.82	10.29							
PICKUP	MANAGER'S PICKUP	ANN	2002	.80	.00	5.16	2.83	.00	.00	.00	.13	2.95	8.11							
PICKUP	LABOR'S PICKUP	ANN	2002	.40	.00	2.73	1.79	.00	.00	.00	.08	1.87	4.60							
LAND COST	LAND COST	ANN	2002	.00	.00	200.00	.00	.00	.00	.00	.00	.00	200.00							
OVERHEAD	UTILITIES, LEGAL, ACCTG & ETC	ANN	2002	.00	.00	.00	.00	.00	19.27	.00	.00	19.27	19.27							
MANAGEMENT	COST OF MANAGEMENT	ANN	2002	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00							
TOTAL PER ACRE				2.13	1.91	287.98	21.99	26.28	168.37	172.68	15.30	404.62	692.60							

\* FOLLOWING POTATOES, A WHEAT COVER CROP IS SEEDED BEFORE THE CHISEL PLOW OPERATION IN THE FALL. THE WHEAT IS SEEDED CUSTOM AERIAL AT AN APPROXIMATE TOTAL COST OF \$15 PER ACRE.

\*\* HERBICIDE IS REQUIRED TO KILL THE COVER CROP ABOUT 50% OF THE TIME. IN THIS BUDGET THE FULL COST OF HERBICIDE WHEN APPLIED IS SHOWN.

\*\*\* PROCESSOR PAYS ONE-HALF THE COST. THUS, ONLY THE COST TO THE PRODUCER IS SHOWN IN THE BUDGET.

BREAK-EVEN PRICE @ A YIELD OF 9 TONS IS \$76.96 PER TON.

TABLE 2SC. MATERIALS AND SERVICES USED BY OPERATION FOR PRODUCING **SWEET CORN** UNDER CENTER PIVOT IRRIGATION.

OPERATION	MONTH	MATERIALS AND/OR SERVICE
SOIL TEST	MARCH	CUSTOM HIRED @ \$0.60/ACRE
HERBICIDE	APRIL	CUSTOM APPLIED @ \$6.25/ACRE 1 PINT GLYPHOSATE @ \$5.31/ACRE SPREADER @ \$0.75/ACRE 1 PINT OF AMMONIUM SULFATE @ \$0.50/PINT
PLANT/FERTILIZE	MAY	SEED @ \$56.25/ACRE 30 LBS. NITROGEN (LIQ) @ \$0.285/LB. 60 LBS. PHOSPHATE (LIQ) @ \$0.34/LB. 15 LBS. SULFUR (LIQ) @ \$0.219 0.5 GAL HUMIC ACID @ \$0.8125/PINT 2.5 LBS. ZINC @ \$1.43/LB. 0.25 LB. BORON @ \$3.14/LB.
HERBICIDE	MAY	CUSTOM APPLIED @ \$6.25/ACRE 2.5 QTS. LASSO @ \$3.375/PINT
IRRIGATION	SEASONAL	.85 HRS. LABOR @ \$16.00/HOUR IRRIGATION CHARGE @ \$40.00/ACRE IRRIGATION POWER @ \$65.00/ACRE IRRIGATION REPAIR @ \$20.00/ACRE
NITROGATE	SEASONAL	170 LBS. NITROGEN (LIQ) @ \$0.285/LB.
INSECTICIDE	SEASONAL	CUSTOM AERIAL @ \$6.00/ACRE 2 OZS. WARRIOR @ \$37.58/PINT
TOPPING	AUGUST	CUSTOM HIRED @ \$10.00/ACRE
OVERHEAD	ANNUAL	5% OF VARIABLE COST

TABLE 3SC. ITEMIZED COST PER ACRE FOR PRODUCING **SWEET CORN**  
 FOLLOWING WHEAT UNDER CENTER PIVOT IRRIGATION IN THE  
 COLUMBIA BASIN, WASHINGTON STATE.

		PRICE OR	VALUE OR	YOUR
		UNIT COST/UNIT	QUANTITY	COST
				FARM
-----				
VARIABLE COSTS		\$		\$
SOIL TEST	ACRE	.60	1.00	.60
SWEET CORN SEED	ACRE	56.25	1.00	56.25
GLYPHOSATE	PINT	5.31	1.00	5.31
SPREADER	ACRE	.75	1.00	.75
AMMONIUM SULFATE	PINT	.50	1.00	.50
LASSO	PINT	3.375	5.00	16.88
CUSTOM HERBICIDE	ACRE	6.25	2.00	12.50
WARRIOR	PINT	37.58	.13	4.70
AERIAL APPLICATION	ACRE	6.00	1.00	6.00
NITROGEN (LIQ)	LB.	.285	200.00	57.00
PHOSPHATE (LIQ)	LB.	.34	60.00	20.40
SULFUR (LIQ)	LB.	.219	15.00	3.29
ZINC (LIQ)	LB.	1.43	2.50	3.57
BORON (LIQ)	LB.	3.14	.25	.79
HUMIC ACID	PINT	.813	4.00	3.25
CUSTOM TOPPING	ACRE	10.00	.50	5.00
GENERAL LABOR	HOURL	12.00	1.06	12.68
IRRIGATION LABOR	HOURL	16.00	.85	13.60
IRRIGATION REPAIR	ACRE	20.00	1.00	20.00
IRRIGATION POWER	ACRE	65.00	1.00	65.00
IRRIGATION WATER	ACRE	40.00	1.00	40.00
TRACTOR REPAIR	ACRE	3.87	1.00	3.87
TRACTOR FUEL/LUBE	ACRE	7.19	1.00	7.19
MACHINERY REPAIRS	ACRE	7.06	1.00	7.06
MACHINE FUEL/LUBE	ACRE	3.86	1.00	3.86
INTEREST ON OP. CAP.	ACRE	15.30	1.00	15.30
OVERHEAD	ACRE	19.27	1.00	19.27
				-----
TOTAL VARIABLE COST				404.62
				-----
FIXED COSTS		\$		\$
TRACTOR DEPRECIATION	ACRE	7.57	1.00	7.57
TRACTOR INTEREST	ACRE	7.22	1.00	7.22
TRACTOR INSURANCE	ACRE	.48	1.00	.48
TRACTOR TAXES	ACRE	1.44	1.00	1.44
TRACTOR HOUSING	ACRE	.80	1.00	.80
MACHINE DEPRECIATION	ACRE	10.84	1.00	10.84
MACHINE INTEREST	ACRE	6.98	1.00	6.98
MACHINE INSURANCE	ACRE	.47	1.00	.47
MACHINE TAXES	ACRE	1.40	1.00	1.40
MACHINE HOUSING	ACRE	.78	1.00	.78
LAND RENT	ACRE	200.00	1.00	200.00
MANAGEMENT	ACRE	50.00	1.00	50.00
				-----
TOTAL FIXED COST				287.98
				-----
TOTAL COST				692.59
				-----



TABLE 4SC. BREAK-EVEN SELLING PRICE PER TON OF **SWEET CORN** PRODUCED IN THE COLUMBIA BASIN UNDER CENTER PIVOT IRRIGATION.

	COST PER ACRE	YOUR FARM	BREAK-EVEN PRICE (\$/TON)	YOUR FARM
	\$	\$	(9 TONS)	\$
1. TOTAL VARIABLE COST	404.62	_____	44.96	_____
PLUS: TRACTOR & MACHINERY INSURANCE	0.95	_____		
TRACTOR & MACHINERY TAXES	2.84	_____		
LAND RENT	200.00	_____		
2. TOTAL CASH COSTS	608.41	_____	67.60	_____
PLUS: TRACTOR & MACHINERY DEPRECIATION	18.41	_____		
3. TOTAL CASH COST & DEPRECIATION	626.82	_____	69.65	_____
PLUS: TRACTOR & MACHINERY INTEREST	14.20	_____		
TRACTOR & MACHINERY HOUSING	1.58	_____		
MANAGEMENT	50.00	_____		
4. TOTAL COST	692.60	_____	76.96	_____

TABLE 5SC. BREAK-EVEN SELLING PRICE PER TON OF **SWEET CORN** PRODUCED AT DIFFERENT YIELD LEVELS.

YIELD LEVEL (TON/ACRE)	BREAK-EVEN PRICE (\$/TON)
8	86.58
9	76.96
10	69.26
11	62.96
12	57.72

TABLE 1GP. SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING **GREEN PEAS** FOLLOWING CORN UNDER CENTER PIVOT IRRIGATION IN THE COLUMBIA BASIN, WASHINGTON STATE.

OPERATION	TOOLING	MTH	YEAR	MACH HOURS	LABOR HOURS	TOTAL FIXED COST	VARIABLE COST					TOTAL VARIABLE COST	TOTAL COST
							FUEL, LUBE, & REPAIRS	LABOR	SERVICE	MATER.	INTER.		
						\$	\$	\$	\$	\$	\$	\$	\$
DISK & PACK	250HP-WT, 20' DISC & PACKER	FALL	2001	.13	.14	4.14	2.71	1.65	.00	.00	.36	4.72	8.86
SUBSOIL	250HP-WT, 12' SUBSOILER	FALL	2001	.22	.24	5.22	4.14	2.93	.00	.00	.58	7.66	12.88
SOIL TEST	CUSTOM HIRED	MAR	2002	.00	.00	.00	.00	.00	.60	.00	.03	.63	.63
FERTILIZE	CUSTOM APPLIED	APR	2002	.00	.00	.00	.00	.00	6.25	36.56	1.93	44.74	44.74
TILL & PLANT	250HP-WT, 12'CHSL CHPR & DRILL	APR	2002	.25	.33	13.78	5.82	3.99	.00	96.00	4.76	110.57	124.35
IRRIGATE	CENTER PIVOT	SEA	2002	.00	.85	.00	.00	13.60	125.00	.00	6.24	144.84	144.84
HERBICIDE	CUSTOM APPLIED	MAY	2002	.00	.00	.00	.00	.00	6.25	18.31	.92	25.48	25.48
HERBICIDE	CUSTOM APPLIED	JUN	2002	.00	.00	.00	.00	.00	6.25	13.42	.59	20.26	20.26
INSECT CONTROL*	CUSTOM AERIAL	JUN	2002	.00	.00	.00	.00	.00	3.00	3.00	.18	6.18	6.18
HARVEST & HAUL	PROVIDED BY THE PROCESSOR	JUL	2002	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
DISK & PACK	250HP-WT, 20' DISK & PACKER	AUG	2002	.13	.14	4.14	2.71	1.65	.00	.00	.07	4.43	8.56
PICKUP	MANAGER'S PICKUP	ANN	2002	.80	.00	5.16	2.83	.00	.00	.00	.13	2.95	8.11
PICKUP	LABOR'S PICKUP	ANN	2002	.40	.00	2.73	1.79	.00	.00	.00	.08	1.87	4.60
LAND COST	LAND RENT	ANN	2002	.00	.00	200.00	.00	.00	.00	.00	.00	.00	200.00
OVERHEAD	UTILITIES, LEGAL, ACCTG & ETC	ANN	2002	.00	.00	.00	.00	.00	18.72	.00	.00	18.72	18.72
MANAGEMENT	COST OF MANAGEMENT	ANN	2002	.00	.00	50.00	.00	.00	.00	.00	.00	.00	50.00
TOTAL PER ACRE				1.92	1.70	285.15	20.00	23.82	166.07	167.29	15.86	393.05	678.20

\* SEVEN OUNCES OF ASANA APPLIED AT A COST OF \$13.69 A PINT OR 85.6 CENTS PER OUNCE, PLUS THE AERIAL APPLICATION FEE OF \$6.00 PER ACRE. SINCE THE PROCESSOR PAYS ONE-HALF THE COSTS, ONLY THE COST TO THE PRODUCER ARE INCLUDED. AN INSECTICIDE, DIMETHOATE, MAY BE REQUIRED IN MAY FOR APHID CONTROL AND MAY ALSO INCLUDE FOLIAR NUTRIENT AT AN ADDITIONAL COST OF \$10 PER ACRE.

BREAK-EVEN PRICE @ A YIELD OF 3.25 TONS IS \$208.68 PER TON.

TABLE 2GP. MATERIALS AND SERVICES USED BY OPERATION FOR PRODUCING  
**GREEN PEAS** UNDER CENTER PIVOT IRRIGATION.

OPERATION	MONTH	MATERIAL AND/OR SERVICE
SOIL TEST	MARCH	CUSTOM HIRED @ \$0.60/ACRE
FERTILIZE	APRIL	CUSTOM GROUND APPLIED @ \$6.25/ACRE 40 LBS. NITROGEN (DRY) @ \$0.229/LB 80 LBS. PHOSPHATE (DRY) @ \$0.22/LB 20 LBS. SULFUR (DRY) @ \$0.195/LB 5 LBS. ZINC (DRY) @ \$1.18/LB
TILL & PLANT	APRIL	240 LBS. OF SEED @ \$0.40/LB
IRRIGATE	SEASONAL	IRRIGATION CHARGE @ \$40.00/ACRE IRRIGATION POWER @ \$65.00/ACRE IRRIGATION REPAIR @ \$20.00/ACRE
HERBICIDE	MAY	CUSTOM GROUND APPLICATION @ \$6.25/ACRE 1.5 PINTS BASAGRAN @ \$11.44/PINT .5 PINT MCPA @ \$2.32/PINT
HERBICIDE	JUNE	CUSTOM GROUND APPLICATION @ \$6.25/ACRE 10 OZS. ASSURE II @ \$18.98/PINT 16 OZS. CROP OIL @ \$1.56/PINT
INSECT CONTROL	JUNE	CUSTOM AERIAL APPLICATION @ \$6.00/ACRE 7 OZS. ASANA @ \$13.69/PINT
OVERHEAD	ANNUAL	5% OF VARIABLE COST

TABLE 3GP. ITEMIZED COST PER ACRE FOR PRODUCING **GREEN PEAS**  
 FOLLOWING CORN UNDER CENTER PIVOT IRRIGATION IN THE  
 COLUMBIA BASIN, WASHINGTON STATE.

		PRICE OR		VALUE OR	YOUR
		UNIT COST/UNIT	QUANTITY	COST	FARM
-----					
VARIABLE COSTS		\$		\$	
SOIL TEST	ACRE	.60	1.00	.60	_____
GREEN PEA SEED	LB.	.40	240.00	96.00	_____
NITROGEN (DRY)	LB.	.229	40.00	9.16	_____
PHOSPHATE (DRY)	LB.	.22	80.00	17.60	_____
SULFUR (DRY)	LB.	.195	20.00	3.90	_____
ZINC (DRY)	LB.	1.18	5.00	5.90	_____
BASAGRAN	PINT	11.43	1.50	17.15	_____
MCPA	PINT	2.32	.50	1.16	_____
ASANA	PINT	13.69	.22	3.00	_____
ASSURE II	PINT	18.98	.63	11.86	_____
CROP OIL	PINT	1.56	1.00	1.56	_____
CUSTOM FERTILIZE	ACRE	6.25	1.00	6.25	_____
CUSTOM HERBICIDE	ACRE	6.25	1.00	12.50	_____
AERIAL APPLICATION	ACRE	6.00	.50	3.00	_____
GENERAL LABOR	HOUR	12.22	1.00	10.22	_____
IRRIGATION LABOR	HOUR	16.00	.85	13.60	_____
IRRIGATION WATER	ACRE	40.00	1.00	40.00	_____
IRRIGATION POWER	ACRE	65.00	1.00	65.00	_____
IRRIGATION REPAIR	ACRE	20.00	1.00	20.00	_____
TRACTOR REPAIR	ACRE	2.98	1.00	2.98	_____
TRACTOR FUEL/LUBE	ACRE	7.34	1.00	7.34	_____
MACHINERY REPAIRS	ACRE	5.81	1.00	5.81	_____
MACHINE FUEL/LUBE	ACRE	3.86	1.00	3.86	_____
INTEREST ON OP. CAP.	ACRE	15.86	1.00	15.86	_____
OVERHEAD	ACRE	18.72	1.00	18.72	_____
				-----	
TOTAL VARIABLE COST				393.05	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	5.84	1.00	5.84	_____
TRACTOR INTEREST	ACRE	5.40	1.00	5.40	_____
TRACTOR INSURANCE	ACRE	.36	1.00	.36	_____
TRACTOR TAXES	ACRE	1.08	1.00	1.08	_____
TRACTOR HOUSING	ACRE	.60	1.00	.60	_____
MACHINE DEPRECIATION	ACRE	11.24	1.00	11.24	_____
MACHINE INTEREST	ACRE	7.72	1.00	7.72	_____
MACHINE INSURANCE	ACRE	.51	1.00	.51	_____
MACHINE TAXES	ACRE	1.54	1.00	1.54	_____
MACHINE HOUSING	ACRE	.86	1.00	.86	_____
LAND RENT	ACRE	200.00	1.00	200.00	_____
MANAGEMENT	ACRE	50.00	1.00	50.00	_____
				-----	
TOTAL FIXED COST				285.15	_____
TOTAL COST				678.20	_____
-----					

TABLE 4GP. BREAK-EVEN SELLING PRICE PER TON OF **GREEN PEAS** PRODUCED IN THE COLUMBIA BASIN UNDER CENTER PIVOT IRRIGATION.

	COST PER ACRE	YOUR FARM	BREAK-EVEN PRICE (\$/TON)	YOUR FARM
	\$	\$	(3.25 TONS)	\$
1. TOTAL VARIABLE COST	393.05	_____	120.94	_____
PLUS: TRACTOR & MACHINERY INSURANCE	0.87	_____		
TRACTOR & MACHINERY TAXES	2.62	_____		
LAND RENT	200.00	_____		
2. TOTAL CASH COSTS	596.54	_____	183.55	_____
PLUS: TRACTOR & MACHINERY DEPRECIATION	17.08	_____		
3. TOTAL CASH COST & DEPRECIATION	613.62	_____	188.81	_____
PLUS: TRACTOR & MACHINERY INTEREST	13.12	_____		
TRACTOR & MACHINERY HOUSING	1.46	_____		
MANAGEMENT	50.00	_____		
4. TOTAL COST	678.20	_____	208.68	_____

TABLE 5GP. BREAK-EVEN SELLING PRICE PER TON OF **GREEN PEAS** PRODUCED AT DIFFERENT YIELD LEVELS.

YIELD LEVEL (TON/ACRE)	BREAK-EVEN PRICE (\$/TON)
2.50	271.28
2.75	246.62
3.00	226.07
3.25	208.68
3.50	193.77
3.75	180.85

TABLE 6. MACHINE DATA.

MACHINE NAME	PURCHASE PRICE \$	YEARS OF USE	SALVAGE VALUE \$	ANNUAL REPAIR COST \$	ANNUAL HOURS OF USE	GALLONS OF FUEL USED PER HOUR
250HP-WT	115,000	15	18,000	3,300	800	5D, 7D, 8D, 10D
150HP-WT	90,000	15	17,000	2,500	600	5D
PICKUP, MANAGEMT	26,000	5	12,000	250	800	2G
PICKUP, LABOR	12,000	5	3,000	500	400	2G
12' SUBSOILER	5,000	15	750	450	125	
13' PACKER	3,600	8	640	175	250	
20' PACKER	4,200	7	840	300	350	
12' CHISEL CHOPPER	20,000	15	4,000	500	100	
20' OFFSET DISC	20,000	10	3,500	1,450	250	
13' CHISEL PLOW	7,000	15	1,000	390	150	
12' DISC DRILL	9,000	10	1,600	675	125	
20' STUBBLE SHREDDER	16,000	15	2,400	850	150	
8R-RESERVIOR TILLER	16,000	15	3,200	1,400	150	
8R-BEDDER	5,000	10	1,000	500	175	
8R-BAND TILLER	27,000	10	5,000	2,000	175	
8R-AIR PLANTER	22,500	10	4,000	1,900	175	
8R-CULTIVATOR	9,000	10	1,600	600	175	
LIQUID FERTILIZER APPLICATOR	3,000	10	600	300	100	

TABLE 7. HOURLY MACHINERY COSTS.

MACHINERY	PURCHASE PRICE	YEARS TO TRADE	ANNUAL HOURS	DEPREC- IATION	INTER- EST	INSUR- ANCE	TAXES	HOUSING	TOTAL FIXED COST	REPAIR	FUEL AND LUBE	TOTAL VARIABLE COST	TOTAL COST
	\$								--COST PER HOUR--				
250HP-WT	115,000.00	15	800	8.08	7.48	.50	1.50	.83	18.39	4.12	8.74*	12.86	31.26
150HP-WT	90,000.00	15	600	8.11	8.03	.54	1.61	.89	19.17	4.17	5.46	9.63	28.80
PICKUP, MANAGEMENT	26,000.00	5	800	3.50	2.14	.14	.43	.24	6.45	.31	3.22	3.53	9.98
PICKUP, LABOR	12,000.00	5	400	4.50	1.69	.11	.34	.19	6.83	1.25	3.22	4.47	11.30
12'SUBSOILER	5,000.00	15	125	2.27	2.07	.14	.41	.23	5.12	3.60	.00	3.60	8.72
13'PACKER	3,600.00	8	250	1.48	.76	.05	.15	.08	2.53	.70	.00	.70	3.23
20'PACKER	4,200.00	7	350	1.37	.65	.04	.13	.07	2.26	.86	.00	.86	3.12
12'CHISEL CHOPPR	20,000.00	15	100	10.67	10.80	.72	2.16	1.20	25.55	5.00	.00	5.00	30.55
20'OFFSET DISC	20,000.00	10	250	6.60	4.23	.28	.85	.47	12.43	5.80	.00	5.80	18.23
13'CHISEL PLOW	7,000.00	15	150	2.67	2.40	.16	.48	.27	5.97	2.60	.00	2.60	8.57
12'DISC DRILL	9,000.00	10	125	5.92	3.82	.25	.76	.42	11.18	5.40	.00	5.40	16.58
20'STUBBLE SHRDR	16,000.00	15	150	6.04	5.52	.37	1.10	.61	13.65	5.67	.00	5.67	19.32
8R-RESERVOIR TILLER	16,000.00	15	150	5.69	5.76	.38	1.15	.64	13.62	9.33	.00	9.33	22.96
8R-BEDDER	5,000.00	10	175	2.29	1.54	.10	.31	.17	4.41	2.86	.00	2.86	7.27
8R-BAND TILLER	27,000.00	10	175	12.57	8.23	.55	1.65	.91	23.91	11.43	.00	11.43	35.34
8R-AIR PLANTER	22,500.00	10	175	10.57	6.81	.45	1.36	.76	19.96	10.86	.00	10.86	30.82
8R-CULTIVATOR	9,000.00	10	175	4.23	2.73	.18	.55	.30	7.98	3.43	.00	3.43	11.41
LIQ FERT. APPLIC.	3,000.00	10	100	2.40	1.62	.11	.32	.18	4.63	3.00	.00	3.00	7.63

\*SHOWN USING 8 GALLONS OF DIESEL PER HOUR. THE FUEL AND LUBE COST FOR 5 GALLONS OF DIESEL PER HOUR IS \$5.46, FOR 7 GALLONS OF DIESEL PER HOUR IS \$7.65, AND FOR 10 GALLONS OF DIESEL PER HOUR IS \$10.92.

TABLE 8. INPUT PRICES.

INPUT	UNIT	PRICE
		\$
<u>FUEL</u>		
GASOLINE	GALLON	1.40
DIESEL	GALLON	0.95
<u>FERTILIZER</u>		
NITROGEN (DRY)	POUND	0.229
NITROGEN (LIQUID)	POUND	0.285
PHOSPHATE (DRY)	POUND	0.22
PHOSPHATE (LIQUID)	POUND	0.34
POTASH (DRY)	POUND	0.169
POTASH (LIQUID)	POUND	0.284
SULFUR (DRY)	POUND	0.195
SULFUR (LIQUID)	POUND	0.219
ZINC (DRY)	POUND	1.18
ZINC (LIQUID)	POUND	1.43
BORON	POUND	3.14
HUMIC ACID	PINT	0.8125
FOLIAR NUTRIENTS	ACRE	4.00
<u>CHEMICALS</u>		
GLYPHOSATE	PINT	5.31
AMMONIUM SULFATE	PINT	0.50
LASSO	PINT	3.375
WARRIOR	PINT	37.58
SONALAN	PINT	3.97
EPTC	PINT	4.50
DIMETHOATE	PINT	5.05
BASAGRAN	PINT	11.435
MCPA	PINT	2.32
ASSURE II	PINT	18.98
CROP OIL	PINT	1.56
ASANA	PINT	13.69
SOLUTION 32	PINT	0.125
SPREADER	ACRE	4.00
<u>SEED</u>		
SWEET CORN SEED	ACRE	56.25
DRY BEAN SEED	ACRE	40.00
GREEN PEA SEED	POUND	0.40
<u>CUSTOM RATES</u>		
FERTILIZE	ACRE	6.25
HERBICIDE	ACRE	6.25
AERIAL APPLICATION	ACRE	6.00
CUT & WINDROW (DRY BEANS)	ACRE	30.00
COMBINE (DRY BEANS)	ACRE	45.00
HAUL (DRY BEANS)	TON	8.50
TOPPING (SWEET CORN)	ACRE	10.00



TABLE 8. INPUT PRICES (CONTINUED).

INPUT	UNIT	PRICE
		\$
<u>IRRIGATION</u>		
IRRIGATION WATER	ACRE	40.00
IRRIGATION POWER	ACRE	65.00
IRRIGATION REPAIR	ACRE	20.00
IRRIGATION LABOR	HOUR	16.00
<u>MISC. INPUTS</u>		
GENERAL LABOR	HOUR	12.00
SOIL TEST	ACRE	0.60
LAND RENT	ACRE	200.00
MANAGEMENT	ACRE	50.00

Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is violation of law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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