

**2005**

**UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION**

**SAMPLE COSTS TO ESTABLISH AND PRODUCE**

# ***WILD RICE***



**INTERMOUNTAIN REGION  
SHASTA – LASSEN COUNTIES – 2005**

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**INTRODUCTION**

The detailed costs for wild rice establishment and production in the Intermountain Region, Fall River Valley and Big Valley area of Shasta and Lassen Counties, are presented in this study. The hypothetical farm used in this report consists of 500 acres with 80 acres of wild rice production and 10 acres dedicated to roads and buildings. The remainder of the farm is planted to row and field crops.

This study consists of Assumptions to Establish and Produce Wild Rice is intended as a guide only. It can be used to make production decisions, determine potential returns, prepare budgets, and evaluate production loans. Practices described are based on the production practices considered typical for this crop and region. Sample costs for labor, materials, equipment, and custom services are based on current figures. “*Your Costs*” columns in Table 1 Costs Per Acre To Establish Wild Rice, Table 2 Costs and Returns Per Acre to Establish Wild Rice, Table 3 Costs Per Acre to Produce Wild Rice, and Table 4 Costs And Returns Per Acre to Produce Wild Rice.

The hypothetical farm operations, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, California, (530) 752-2414 or the local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

## ASSUMPTIONS

The following assumptions pertain to sample costs to establish and produce wild rice in Shasta and Lassen Counties of the Intermountain Region. The costs are based on the cultural practices used by growers in the region, some of which may not be used during every establishment or production year. The cultural practices and production inputs for growing wild rice vary considerably amongst growers and fields. Costs are represented on an annual, per acre basis. The use of trade names in this report does not constitute an endorsement or recommendation by the University of California, nor is any criticism implied by omission of other similar products.

**Land and Rent.** The study is based on a 500 acre field and row crop farm, of which 80 acres are dedicated to growing wild rice and 10 acres are occupied by roads and farmstead. Other crops that may be grown on the farm are small grains, timothy hay, sudangrass hay, and pasture. The land is valued at \$2,000 per acre. In this study, the land is rented on a cash basis with the landowner receiving \$150 per acre. The tenant pays all cash costs to produce the crop. Interest cost for the land, and the depreciation and maintenance costs for the irrigations system are incurred by the landowner. Other rental agreements for wild rice include combinations of rent and cost. For example, the landowner pays, in addition to the above costs, one-third of the irrigation electrical costs and fertilizer costs. The landowner receives one-third of the gross income and the tenant pays all other cash costs.

**Seed Variety.** In this study, certified seed is planted for grain production. Franklin, the current California seed variety selected for high yield and high shatter resistance, is maintained by the University of California Foundation Seed Services. Certified seed is produced from foundation seed purchased from California Foundation Seed Services. Only one generation of certified seed can be produced from a foundation seed field. Typically, growers purchase certified seed in the fall and place it in cold storage until spring planting.

**Labor.** Basic hourly wages for workers are \$9.00 per hour for machine and \$7.50 per hour for non-machine (field workers) labor. Adding 48% for the employers' share of federal and state payroll taxes, insurance, and other benefits increases the labor rates to \$13.32 per hour for machine and \$11.10 per hour for non-machine labor. The labor for operations involving machinery are 20% higher than the operation time to account for the extra labor involved in equipment set up, moving, maintenance and repair. A farm manager is paid \$2,896 per month or \$34,750 per year. Adding the employers' share of payroll taxes and benefits brings the cost to \$51,430 and is included as cash overhead. In addition, the farm manager is furnished a leased pickup for personal and business use. The pickup is valued at \$1,000 per month, which includes license, insurance, and fuel, is included as cash overhead. Any returns above total costs are considered a return to management and investment.

## STAND ESTABLISHMENT, PRODUCTION CULTURAL PRACTICES, AND MATERIAL INPUTS

**Site Preparation.** The seedbed, or paddy, preparation begins in April by discing the field in two different directions. A custom operator then laser levels the field and pulls the levees. Most growers build permanent straight levee systems with each paddy being about ten acres. The grower installs the rice boxes in the levees using a backhoe. Rice paddies are touched-up by custom landleveling every five years.

**Fertilization.** Gypsum at 500 pounds per acre is applied pre-plant by ground as a calcium and sulfur source. Urea at 115 pounds of N per acre and ten pounds of actual zinc per acre as zinc sulfate is ground applied prior to planting. The zinc application is assumed to provide adequate zinc for the entire five

year production cycle. The fertilizers are incorporated in a single pass with a disc. The crop is not top-dressed during the establishment year. During the production years, Urea at 68 pounds of N per acre is applied by air in May at flooding. An additional application of Urea at 68 pounds per acre of N is applied by air just prior to boot (seed head formed, but not emerged) in late June. Leaf analysis, costing \$1.00 per acre, is done in July (boot stage) to determine if the N and Zn levels are adequate.

**Irrigation.** Wild rice is irrigated in much the same way as white rice (*Oryza sativa*), by flooding paddies in between levees. Flooding begins in May in both the establishment and production years and is maintained throughout the season. In the establishment year the flooding is done after planting. The fields are drained prior to harvest. After the post harvest operations, the fields are flooded with about 4 acre inches to seal the seedbed for the winter. A total of 48 acre inches are applied to the field. The water is pumped from the river using a 10 hp electric pump with a 20 foot lift. The pumping cost is \$13.00 per acre foot.

**Stand Establishment.** Wild rice is planted at a rate of 100 pounds of seed per acre. Planting occurs in May before the paddies are flooded. Seed shatter prior to and during harvest will reseed the field in the following years. This results in plants being naturally selected with high shattering ability, thus decreasing harvested yield. To maintain an adequate yield during the production years, fields are replanted after the fourth production year with new certified seed to maintain shatter resistance. Prior to reseeding, a rotation crop or fallowing is recommended to eliminate volunteer seed.

Growers pay approximately \$0.80 per pound for the green seed (certified Franklin) in the fall. Wild rice seed is stored in cold water, and in the spring, the grower pays an additional \$0.20 per pound for the cold storage in Yuba City. In this study, the seed is brought back in the spring for planting at a total cost of \$1.00 per pound that includes the earlier purchase of the seed and cold storage. Some growers may plant foundation seed to produce one year of certified seed, but this seed cost is not included in this study. Growers purchasing foundation seed will pay \$2.00 per pound.

**Pest Management.** Pest management consists of continuous bird control and custom air applications of an insecticide and algacide treatments. For information and specific pesticide use, contact your pest control advisor. Written recommendations are required for many pesticides and are written by licensed pest control advisors. For additional information contact the Shasta-Lassen County field crop Farm Advisor. Pesticide use permits are available at the county Agricultural Commissioner Office.

*Insect and Algae.* Copper sulfate is used for algae control and is applied to about 50% of the acreage. During the establishment year Malathion 55 is applied to 25% of the acreage for midge control.

*Vertebrate.* Many species of birds eat the seed heads and are considered a pest in wild rice. Growers control bird damage using several different techniques. In this study, birds are managed by shooting them with a shotgun and by using scare devices such as bird screamers and zon guns. Growers also build traps for birds that cause problems with the crop. One trap will cover 40 acres sufficiently. No other pest problems are assumed.

*Weeds.* No herbicides are registered for weed control in wild rice during the growing season. The levees are maintained by spraying with Roundup at 2 quarts per acre in the fall during the establishment year, and in the spring and fall during the production years. The herbicide Shark (carfenthrazole-ethyl) is registered for suppression of common waterplantain, *Alisma plantago-aquatica*, and California arrowhead, *Sagittaria sagittifolia*, but is not commonly used.

**Establishment Costs.** The establishment cost is the sum of cash costs for land preparation, planting, production expenses, and cash overhead for growing wild rice through the first year of harvest minus any returns from production. The Total Accumulated Net Cash Cost in the first year as shown in Table 2 represents the establishment cost per acre. For this study, the cost is \$217 per acre or \$17,360 for the 80 acre field. The establishment cost is amortized over the remaining four years of crop life.

**Harvest.** Wild rice is typically harvested when grain in the heads is fully mature (dark purple – black) and grain moisture is 32% moisture. Early harvest occurs when birds cause heavy shattering and when the plants lodge from excessive nitrogen or bad weather. Paddies are drained a few days to a week before harvest to allow soils to provide better footing for the combine. The wild rice is usually custom harvested because fields are small and harvesting equipment is costly. Trucks for the bankout operation and transportation to the cooperative are provided by the grower. Bins are loaded onto the bobtail truck at the cooperative and transported to the field for filling. The harvested material is dumped directly from the harvester into the bins on the truck for transportation to the cooperative. It is assumed that the grower owns 20% of the seed bins required for the harvest.

If a grower does his own harvesting, equipment for the required operations should be added to the investments on Tables 1, 3 and 6. Labor, fuel, repairs, depreciation and interest on investment would need to be added to the harvest operations and custom charges subtracted.

**Transportation.** Growers use a two and half ton truck from the field to move the harvested wild rice the local processing plant. Some growers haul wild rice to processing plant in the Sacramento Valley, a roundtrip of approximately 420 miles. Those transportation costs of about \$30 per ton are paid by the grower, but are not shown in this study.

**Post-Harvest.** The paddies are disced twice with a stubble disc to chop and incorporate the chaff into the soil for decomposition. The fields are then flooded to maintain the moisture in the volunteer rice seed that will be next years crop and to seal the field for the winter. For additional income, some growers place duck blinds in the levees, flood the field during the winter, and rent the blinds for hunting. However, hunting is not included in this study.

**Yields & Returns.** The crop yield used in this study is a green weight of 1,400 pounds per acre for the establishment year and 1,600 pounds per acre in the production year. It is assumed that the grower will have 50% recovery. The recovery rate is the percentage of finished (marketable) wild rice by weight in relation to green weight at harvest taking into account shatter, moisture and, cleaning losses. An estimated return price of \$0.48 per pound of green grain at 50% recovery is used. Returns will vary according to seed quality and market. The yields and prices used in this cost study are estimates based on the current market.

**Assessments.** A State marketing order requires mandatory assessment fees to support the California Wild Rice Program. These fees are assessed each year at \$8.00 per acre. It is assumed that the wild rice grower in this cost study is a member of the Fall River Wild Rice Cooperative and pays a yearly acreage fee of \$1.00 per acre. Growers that become a member of the cooperative are charged a refundable, one-time membership fee of \$5,000. The cooperative has a membership limit and new members must be approved by the board of directors and/or purchase a membership from current members. Member growers that increase their wild rice acreage over their original acreage must pay an expansion fee which varies from year to year. Contact the Fall River Wild Rice Cooperative, Osprey Drive, Fall River Mills, CA 96028 for further information.

**Risk.** The risks associated with the production of wild rice should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of wild rice production. Because of the risks involved, access to a market is crucial. A grower should identify potential markets and, where possible, have a contract for their grain before any wild rice production begins.

## CASH OVERHEAD COSTS

*Property Tax.* Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis. Salvage value for investments will vary.

*Interest On Operating Capital.* Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 7.65% per year. A nominal interest rate is the going market cost of borrowed funds.

*Insurance.* Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.690% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$917 for the entire farm or \$1.83 per acre.

*Office Expense.* Various farm and office expenses are estimated at \$30 per acre for the ranch. These expenses include office supplies, utilities, telephones, bookkeeping, accounting, legal fees and maintenance, etc.

*Equipment Operating Costs.* Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum Power-Take-Off (PTO) horsepower, and fuel type.

Prices for on-farm delivery of diesel and gasoline are \$1.51 and \$2.05 per gallon, respectively. Costs are based on current delivery prices quoted by distributors and 2004 monthly price data. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise taxes that are refundable for on-farm use when filing income tax return.

The fuel, lube, and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 7 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

## NON-CASH OVERHEAD COSTS

**Investment.** The investments shown in Table 6 are those that are partially or completely allocated to the wild rice operation. Costs of investments such as tractors, trucks, buildings, etc. can be spread over the whole farm. Annual investments shown in Tables 1 and 3 represent depreciation and opportunity cost for each investment on an annual per acre basis.

*Capital Recovery.* Capital recovery cost is calculated for equipment and other farm investments. Although farm equipment used on mint farms might be purchased new or used, this study shows the

current purchase price for new equipment. The new purchase price is adjusted to 40% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1-4, and 6. They represent the capital recovery cost for investments on an annual per acre basis.

Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase prices and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows.

$$\left[ \left( \frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Capital Recovery Factor}} \right) + \left[ \frac{\text{Salvage Value} \times \text{Interest Rate}}{\text{Interest Rate}} \right] \right]$$

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its life. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The life in years is estimated by dividing the wear-out life, as given by American Society of Agricultural Engineers (ASAE) by the annual use in hours. Salvage value is calculated as

$$\text{New Price} \times \% \text{ Remaining Value}$$

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate from use. The purchase price and salvage value for certain equipment and investments are shown in Table 4.

*Capital Recovery Factor.* Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. It is the function of the interest rate and years of life of the equipment.

*Interest Rate.* The interest rate of 6.01% used to calculate capital recovery cost is the USDA-ERS’s ten year average of California’s agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector. In other words, the next best alternative use for these resources is in another agricultural enterprise.

*Non-Cash Equipment Costs.* Much of the equipment inventory on a typical wild rice farm in Shasta and Lassen counties have high hours of use which reduces its value. This study shows current purchase prices for new equipment with an adjustment of 40% of new value to indicate a mix of new and used equipment.

The equipment listed in Tables 6 and 7 indicate only that equipment which is used in the wild rice enterprise and does not necessarily include all of the equipment that would be found on a typical farm growing wild rice.

**Table Values.** Due to rounding, the totals may be slightly different from the sum of the components.

**Acknowledgment.** Appreciation is expressed to those growers and other cooperators who provided support for this study.

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Table 1.

U.C. COOPERATIVE EXTENSION  
COST PER ACRE TO ESTABLISH WILD RICE  
INTERMOUNTAIN REGION  
SHASTA & LASSEN COUNTIES - 2005

Labor Rate: \$13.32/hr. machine labor  
\$11.10/hr. non-machine labor

Short Term Interest Rate: 7.65%

Operation	Operation Time (Hrs/A)	----- Cash and Labor Costs per Acre -----					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Pre-plant Costs:								
Disk 2X	0.33	5	8	0	0	13		
Touch-Up Leveling - 1 every 5 Years	0.00	0	0	0	25	25		
Install Boxes 1 Box per 10 Acres	0.50	9	1	16	0	27		
Fertilize - Urea @ 115 Lbs N/Acre	0.17	3	1	46	0	50		
Disk 1X - Incorporate Fertilizer	0.18	3	4	0	0	7		
Fertilize - Zinc @ 10 Lbs/Acre	0.17	3	1	16	0	20		
Fertilize - Gypsum @ 500 Lbs/Acre	0.00	0	0	10	9	19		
<b>TOTAL PRE-PLANT COSTS</b>	<b>1.34</b>	<b>23</b>	<b>15</b>	<b>89</b>	<b>33</b>	<b>161</b>		
Cultural:								
Flood & Maintain Water	0.75	8	0	91	0	99		
Seed	0.13	2	1	100	0	103		
Roll Seedbed	0.18	3	1	0	0	4		
Bird Control	1.50	17	0	33	0	50		
Algae Control - 50% of Acres	0.00	0	0	5	3	8		
Midge Control - 25% of Acres	0.00	0	0	2	2	3		
Pickup Truck Use	0.57	9	5	0	0	14		
ATV Use	0.45	7	1	0	0	8		
<b>TOTAL CULTURAL COSTS</b>	<b>3.57</b>	<b>46</b>	<b>8</b>	<b>231</b>	<b>5</b>	<b>289</b>		
Harvest:								
Combine Rice	0.00	0	0	0	100	100		
Haul To Coop	0.25	4	2	0	0	6		
<b>TOTAL HARVEST COSTS</b>	<b>0.25</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>100</b>	<b>106</b>		
Assessments:								
Wild Rice Marketing Order	0.00	0	0	8	0	8		
Wild Rice Cooperative Annual Fee	0.00	0	0	1	0	1		
<b>TOTAL ASSESSMENT COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>		
Post-Harvest:								
Disc Stubble 2X	0.33	5	8	0	0	13		
Weed Control 10% acres	0.01	0	0	2	0	2		
Flood Wet/Seal Field	0.25	3	0	8	0	11		
<b>TOTAL POST-HARVEST COSTS</b>	<b>0.59</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>0</b>	<b>26</b>		
<b>Interest on Operating Capital @ 7.65%</b>						<b>11</b>		
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>81</b>	<b>32</b>	<b>339</b>	<b>138</b>	<b>601</b>		
CASH OVERHEAD:								
Office Expense						33		
Liability Insurance						2		
Land Rent						150		
Farm Manager Salary						95		
Property Taxes						2		
Property Insurance						1		
Investment Repairs						4		
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>288</b>		
<b>TOTAL CASH COSTS/ACRE</b>						<b>889</b>		
NON-CASH OVERHEAD:								
		Per producing				-- Annual Cost --		
Investment		Acres				Capital Recovery		
Fuel Tanks & Pumps		19			2		2	
Fuel Wagon		4			1		1	
Rice Bins (8)		50			7		7	
Shop Building		95			7		7	
Shop Tools		24			3		3	
Zon Guns (4)		20			3		3	
Bird Traps (2)		1			0		0	
Equipment		163			19		19	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>376</b>			<b>40</b>		<b>40</b>	
<b>TOTAL COSTS/ACRE</b>						<b>930</b>		

Table 2.

U.C. COOPERATIVE EXTENSION  
 COST AND RETURNS PER ACRE TO ESTABLISH WILD RICE  
 INTERMOUNTAIN REGION  
 SHASTA & LASSEN COUNTIES - 2005

Labor Rate: \$13.32/hr. machine labor  
 \$11.10/hr. non-machine labor

Short Term Interest Rate: 7.65%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Wild Rice	1,400	Lb	0.48	<u>672</u>	
<b>TOTAL GROSS RETURNS FOR WILD RICE</b>				<u>672</u>	
<b>OPERATING COSTS</b>					
Custom:					
Touch-Up Leveling	1.00	Acre	25	25	
Ground Application - Gypsum	1.00	Acre	9	9	
Air Application	0.75	Acre	6	5	
Combine Rice	1.00	Acre	100	100	
Irrigation:					
Rice Boxes	0.10	Box	165	16	
River Water - Pumped	48.00	AcIn	2	99	
Fertilizer:					
Urea	115.00	Lb N	0	46	
Zinc Sulfate 36%	28.00	Lb	1	16	
Gypsum	500.00	Lb	0	10	
Seed:					
Seed (Franklin)	100.00	Lb	1	100	
Bird Control:					
Shotgun Shells	6.00	Box	4	23	
Bird Screammers	0.50	Each	22	11	
Algaecide:					
Copper Sulfate	5.00	Lb	1	5	
Insecticide:					
Malathion 55	0.50	Pint	4	2	
Herbicide:					
Roundup Ultra Max	0.20	Pint	9	2	
Assessments:					
California Wild Rice Board	1.00	Acre	8	8	
Fall River Cooperative Annual Fee	1.00	Acre	1	1	
Labor (machine)	3.91	hrs	13	52	
Labor (non-machine)	2.60	hrs	11	29	
Fuel - Gas	2.01	gal	2	4	
Fuel - Diesel	11.05	gal	2	17	
Lube				3	
Machinery repair				8	
Interest on Operating Capital @ 7.65%				<u>11</u>	
<b>TOTAL OPERATING COSTS/ACRE</b>				<u>601</u>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<u>71</u>	
<b>CASH OVERHEAD COSTS:</b>					
Office Expense				33	
Liability Insurance				2	
Land Rent				150	
Farm Manager Salary				95	
Property Taxes				2	
Property Insurance				1	
Investment Repairs				<u>4</u>	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<u>288</u>	
<b>TOTAL CASH COSTS/ACRE</b>				<u>889</u>	
<b>TOTAL ACCUMULATED NET CASH COST (ESTABLISHMENT COSTS):</b>				<u>217</u>	

U.C. COOPERATIVE EXTENSION  
Table 2. continued

NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):	
Fuel Tanks & Pumps	2
Fuel Wagon	1
Rice Bins (8 Each)	7
Shop Building	7
Shop Tools	3
Zon Guns (4 Each)	3
Bird Traps (2 Each)	0
Equipment	19
TOTAL NON-CASH OVERHEAD COSTS/ACRE	40
<hr/>	
TOTAL COSTS/ACRE	930
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NET RETURNS ABOVE TOTAL COSTS	-258
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Table 3.

U.C. COOPERATIVE EXTENSION  
 COSTS PER ACRE TO PRODUCE WILD RICE  
 INTERMOUNTAIN REGION  
 SHASTA & LASSEN COUNTIES - 2005

Labor Rate: \$13.32/hr. machine labor  
 \$11.10/hr. non-machine labor

Short Term Interest Rate: 7.65%

Operation	----- Cash and Labor Costs per Acre -----						Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent	Total Cost	
<b>Cultural:</b>							
Weed Control - Borders 10% Acres	0.00	0	0	54	16	70	
Border Maintenance/Repairs	0.01	0	0	3	0	4	
Fertilize - Urea @ 68 Lbs of N/Acre 2X	0.10	2	0	0	0	2	
Flood & Maintain Water	0.75	8	0	91	0	99	
Bird Control - Zon Guns	0.10	1	0	0	0	1	
Bird Control	1.50	17	0	34	0	50	
Algae Control - 50% of Acres	0.00	0	0	5	3	8	
Tissue Samples	0.10	1	0	0	3	4	
Pickup Use	0.45	7	4	0	0	11	
ATV Use	0.45	7	1	0	0	8	
<b>TOTAL CULTURAL COSTS</b>	<b>3.46</b>	<b>43</b>	<b>5</b>	<b>187</b>	<b>22</b>	<b>257</b>	
<b>Harvest:</b>							
Combine Rice	0.00	0	0	0	100	100	
Haul To Coop	0.25	4	2	0	0	6	
<b>TOTAL HARVEST COSTS</b>	<b>0.25</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>100</b>	<b>106</b>	
<b>Assessment:</b>							
Wild Rice Marketing Order	0.00	0	0	8	0	8	
Fall River Wild Rice Cooperative Annual Fee	0.00	0	0	1	0	1	
<b>TOTAL ASSESSMENT COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>	
<b>Post-Harvest:</b>							
Disc Stubble 2X	0.66	11	15	0	0	26	
Weed Control - Borders 10% Acres	0.01	0	0	3	0	4	
Flood Wet/Seal Field	0.25	3	0	12	0	15	
<b>TOTAL POST-HARVEST COSTS</b>	<b>0.92</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>0</b>	<b>44</b>	
Interest on Operating Capital @ 7.65%						5	
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>61</b>	<b>22</b>	<b>212</b>	<b>122</b>	<b>422</b>	
<b>CASH OVERHEAD:</b>							
Office Expense						33	
Liability Insurance						2	
Land Rent						150	
Farm Manager						95	
Property Taxes						2	
Property Insurance						1	
Investment Repairs						5	
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>287</b>	
<b>TOTAL CASH COSTS/ACRE</b>						<b>709</b>	
<b>NON-CASH OVERHEAD:</b>							
		Per producing		-- Annual Cost --			
Investment		<u>Acres</u>		<u>Capital Recovery</u>			
Establishment Cost		217		63		63	
Fuel Tanks & Pumps		19		2		2	
Fuel Wagon		4		1		1	
Shop Building		95		7		7	
Shop Tools		24		3		3	
Zon Guns (4)		20		3		3	
Bird Traps (2)		5		1		1	
Rice Bins (8)		50		7		7	
Equipment		103		12		12	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>		<b>537</b>		<b>97</b>		<b>97</b>	
<b>TOTAL COSTS/ACRE</b>						<b>805</b>	

Table 4.

U.C. COOPERATIVE EXTENSION  
 COSTS AND RETURNS PER ACRE TO PRODUCE WILD RICE  
 INTERMOUNTAIN REGION  
 SHASTA & LASSEN COUNTIES - 2005

Labor Rate: \$13.32/hr. machine labor		Short Term Interest Rate: 7.65%			
\$11.10/hr. non-machine labor					
	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
WILD RICE	1,600	Pounds	0.48	<u>768</u>	
<b>TOTAL GROSS RETURNS FOR WILD RICE</b>				<u>768</u>	
<b>OPERATING COSTS</b>					
Fertilizer:					
Urea 46-0-0	136.00	Lb N	0	54	
Custom:					
Air Application	2.50	Acre	8	19	
Tissue Analysis	1.00	Acre	3	3	
Combine Rice	1.00	Acre	100	100	
Herbicide:					
Roundup Ultra Max	0.80	Pint	9	7	
Irrigation:					
Pumped River Water	50.00	AcIn	2	103	
Bird Control:					
Propane - Zon Gun	0.25	Gal	1	0	
Shotgun Shells	6.00	Box	4	23	
Bird Screammers	0.50	Each	22	11	
Algaecide:					
Copper Sulfate	5.00	Lb	1	5	
Assessment:					
California Wild Rice Board	1.00	Acre	8	8	
Fall River Wild Rice Cooperative Annual Fee	1.00	Acre	1	1	
Labor (machine)	2.32	Hrs	13	31	
Labor (non-machine)	2.70	Hrs	11	30	
Fuel - Gas	1.66	Gal	2	3	
Fuel - Diesel	7.74	Gal	2	12	
Lube				2	
Machinery repair				5	
Interest on Operating Capital @ 7.65%				<u>5</u>	
<b>TOTAL OPERATING COSTS/ACRE</b>				<u>422</u>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<u>346</u>	
<b>CASH OVERHEAD COSTS:</b>					
Office Expense				33	
Liability Insurance				2	
Land Rent				150	
Farm Manager Salary				95	
Property Taxes				2	
Property Insurance				1	
Investment Repairs				<u>5</u>	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<u>287</u>	
<b>TOTAL CASH COSTS/ACRE</b>				<u>709</u>	
<b>NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):</b>					
Stand Establishment Cost				63	
Fuel Tanks & Pumps				2	
Fuel Wagon				1	
Shop Building				7	
Shop Tools				3	
Zon Guns (4)				3	
Bird Traps (2)				1	
Rice Bins (8)				7	
Equipment				<u>12</u>	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				<u>97</u>	
<b>TOTAL COSTS/ACRE</b>				<u>805</u>	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				<u>-37</u>	

Table 5.

U.C. COOPERATIVE EXTENSION  
MONTHLY CAST COSTS PER ACRE TO PRODUCE WILD RICE  
INTERMOUNTAIN REGION  
SHASTA & LASSEN COUNTIES - 2005

Beginning JAN 05	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 05	05	05	05	05	05	05	05	05	05	05	05	05	
Cultural:													
Weed Control - Borders 10% Acres				4									4
Border Maintenance/Repair				2									2
Fertilize 68 Lbs of N/Acre 2X					35	35							70
Flood & Maintain Water					32	28	28	12					99
Bird Control - Zon Guns					1								1
Bird Control					9		19	22					50
Algae Control - 50% of Acres						8							8
Tissue Samples							4						4
Pickup Use				2	2	2	2	2	2				11
ATV Use				<u>-1</u>	<u>-1</u>	<u>-1</u>	<u>-1</u>	<u>-1</u>	<u>-1</u>				<u>8</u>
<b>TOTAL CULTURAL COSTS</b>				9	81	74	53	38	3				257
Harvest:													
Combine Rice								100					100
Haul To Cooperative								<u>6</u>					<u>6</u>
<b>TOTAL HARVEST COSTS</b>								106					106
Assessment:													
Wild Rice Marketing Order								8					8
Fall River Wild Rice Cooperative Annual Fee								<u>1</u>					<u>1</u>
<b>TOTAL ASSESSMENT COSTS</b>								9					9
Post-Harvest:													
Disc Stubble 2X									26				26
Weed Control - Borders 10% Acres									4				4
Flood Wet/Seal Field									<u>15</u>				<u>15</u>
<b>TOTAL POST-HARVEST COSTS</b>									44				44
Interest on Operating Capital @ 7.65%				0	1	1	1	2	0				5
<b>TOTAL OPERATING COSTS/ACRE</b>				9	81	75	55	155	47				422
CASH OVERHEAD:													
Office Expense				5	5	5	5	5	5				33
Liability Insurance	2												2
Land Rent									150				150
Farm Manager Salary	8	8	8	8	8	8	8	8	8	8	8	8	95
Property Taxes	1							1					2
Property Insurance	1						1						1
Investment Repairs	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-0</u>	<u>-5</u>
<b>TOTAL CASH OVERHEAD COSTS</b>	12	8	8	14	14	14	15	14	164	8	8	8	287
<b>TOTAL CASH COSTS/ACRE</b>	12	8	8	23	95	88	70	169	211	8	8	8	709

Table 6.

U.C. COOPERATIVE EXTENSION  
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS  
INTERMOUNTAIN REGION  
SHASTA & LASSEN COUNTIES - 2005

ANNUAL EQUIPMENT COSTS								
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -		Total
						Insur- ance	Taxes	
05	165 HP 4WD Tractor	114,512	12	28,630	11,970	494	716	13,180
05	ATV	6,459	7	2,450	866	31	45	941
05	100 Gal ATV Sprayer with Boom	5,218	10	923	639	21	31	691
05	Backhoe	28,958	10	5,121	3,548	118	170	3,836
05	Disc Stubble 14'	20,849	12	2,888	2,317	82	119	2,518
05	Pickup - 3/4 Ton 4WD	35,600	7	13,504	4,771	169	246	5,186
05	Truck - 2.5 Ton 2WD	27,465	15	5,347	2,600	113	164	2,877
TOTAL		239,061		58,863	26,711	1,028	1,490	29,229
40% of New Cost *		95,624		23,545	10,685	411	596	11,692

\* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS								
Description	Price	Yrs Life	Salvage Value	Capital Recovery	----- Cash Overhead -----			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Bird Traps (2)	400	10		54	1	2	40	98
Establishment Cost	17,360	4		5,011	0	0	0	5,011
Fuel Tanks & Pumps	9,315	20		813	32	47	280	1,172
Fuel Wagon	2,000	10	200	257	8	11	60	335
Rice Bins (8)	4,000	10		544	14	20	0	578
Shop Building	46,332	30		3,370	160	232	450	4,211
Shop Tools	11,583	10	1,158	1,487	44	64	1,158	2,752
Zon Guns (4)	1,625	10		221	6	8	16	251
TOTAL INVESTMENT	92,615		1,358	11,756	264	383	2,004	14,407

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Farm Manager Salary	500	Acre	93.13	46,565
Land Rent	80	Acre	150.00	12,000
Liability Insurance	500	Acre	1.83	915
Office Expense	490	Acre	32.50	15,925

Table 7.

U.C. COOPERATIVE EXTENSION  
 HOURLY EQUIPMENT COSTS  
 INTERMOUNTAIN REGION  
 SHASTA & LASSEN COUNTIES – 2005

		----- COSTS PER HOUR -----							
		Actual	- Cash Overhead -			----- Operating -----			
Yr	Description	Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
05	165 HP 4WD Tractor	1,361.4	3.52	0.15	0.21	1.94	16.63	18.57	22.45
05	ATV	282.7	1.22	0.04	0.06	0.32	1.57	1.89	3.22
05	100 Gal ATV Sprayer with Boom	149.7	1.71	0.06	0.08	0.93	0.00	0.93	2.77
05	Backhoe	260.0	5.46	0.18	0.26	2.94	0.00	2.94	8.85
05	Disc Stubble 14'	192.1	4.82	0.17	0.25	2.21	0.00	2.21	7.45
05	Pickup - 3/4 Ton 4WD	285.0	6.70	0.24	0.34	1.74	7.07	8.81	16.09
05	Truck - 2.5 Ton 2WD	133.0	7.82	0.34	0.49	1.70	5.21	6.91	15.57



Table 8.

U.C. COOPERATIVE EXTENSION  
RANGING ANALYSIS  
INTERMOUNTAIN REGION  
SHASTA & LASSEN COUNTIES - 2005

	YIELD (POUNDS/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
COSTS PER ACRE AT VARYING YIELDS FOR WILD RICE							
<b>OPERATING COSTS/ACRE:</b>							
Cultural Cost	257	257	257	257	257	257	257
Harvest Cost	104	104	105	106	106	107	108
Assessment Cost	9	9	9	9	9	9	9
Post-Harvest Cost	44	44	44	44	44	44	44
Interest on operating capital	5	5	5	5	5	5	5
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>420</b>	<b>420</b>	<b>421</b>	<b>422</b>	<b>422</b>	<b>423</b>	<b>424</b>
<b>TOTAL OPERATING COSTS/LB</b>	<b>0.42</b>	<b>0.35</b>	<b>0.30</b>	<b>0.26</b>	<b>0.23</b>	<b>0.21</b>	<b>0.19</b>
<b>CASH OVERHEAD COSTS/ACRE</b>	<b>287</b>	<b>287</b>	<b>287</b>	<b>287</b>	<b>287</b>	<b>287</b>	<b>287</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>706</b>	<b>707</b>	<b>708</b>	<b>709</b>	<b>709</b>	<b>710</b>	<b>711</b>
<b>TOTAL CASH COSTS/LB</b>	<b>0.71</b>	<b>0.59</b>	<b>0.51</b>	<b>0.44</b>	<b>0.39</b>	<b>0.36</b>	<b>0.32</b>
<b>NON-CASH OVERHEAD COSTS/ACRE</b>	<b>96</b>	<b>96</b>	<b>96</b>	<b>97</b>	<b>97</b>	<b>97</b>	<b>97</b>
<b>TOTAL COSTS/ACRE</b>	<b>802</b>	<b>803</b>	<b>804</b>	<b>805</b>	<b>806</b>	<b>807</b>	<b>808</b>
<b>TOTAL COSTS/LB</b>	<b>0.80</b>	<b>0.67</b>	<b>0.57</b>	<b>0.50</b>	<b>0.45</b>	<b>0.40</b>	<b>0.37</b>

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WILD RICE							
PRICE (DOLLARS/POUNDS)	YIELD (POUNDS/ACRE)						
	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Wild Rice							
0.33	-90	-24	41	106	172	237	302
0.38	-40	36	111	186	262	337	412
0.43	10	96	181	266	352	437	522
0.48	60	156	251	346	442	537	632
0.53	110	216	321	426	532	637	742
0.58	160	276	391	506	622	737	852
0.63	210	336	461	586	712	837	962

NET RETURNS PER ACRE ABOVE CASH COSTS FOR WILD RICE							
PRICE (DOLLARS/POUNDS)	YIELD (POUNDS/ACRE)						
	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Wild Rice							
0.33	-376	-311	-246	-181	-115	-50	15
0.38	-326	-251	-176	-101	-25	50	125
0.43	-276	-191	-106	-21	65	150	235
0.48	-226	-131	-36	59	155	250	345
0.53	-176	-71	34	139	245	350	455
0.58	-126	-11	104	219	335	450	565
0.63	-76	49	174	299	425	550	675

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR WILD RICE							
PRICE (DOLLARS/POUNDS)	YIELD (POUNDS/ACRE)						
	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Wild Rice							
0.33	-472	-407	-342	-277	-212	-147	-82
0.38	-422	-347	-272	-197	-122	-47	28
0.43	-372	-287	-202	-117	-32	53	138
0.48	-322	-227	-132	-37	58	153	248
0.53	-272	-167	-62	43	148	253	358
0.58	-222	-107	8	123	238	353	468

Table 9.

U.C. COOPERATIVE EXTENSION  
 COSTS AND RETURNS/ BREAKEVEN ANALYSIS  
 INTERMOUNTAIN REGION  
 SHASTA & LASSEN COUNTIES - 2005

**COSTS AND RETURNS - PER ACRE BASIS**

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Wild Rice	768	422	346	709	59	805	-37

**COSTS AND RETURNS - TOTAL ACREAGE**

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Wild Rice	61,440	33,736	27,704	56,694	4,746	64,426	-2,986

**BREAKEVEN PRICES PER YIELD UNIT**

CROP	Base Yield (Units/Acre)	Yield Units	----- Breakeven Price To Cover -----		
			Operating Costs	Cash Costs	Total Costs
----- \$ per Yield Unit -----					
Wild Rice	1,600	Lb	0.26	0.44	0.50

**BREAKEVEN YIELDS PER ACRE**

CROP	Yield Units	Base Price (\$/Unit)	----- Breakeven Yield To Cover -----		
			Operating Costs	Cash Costs	Total Costs
----- Yield Units / Acre -----					
Wild Rice	Lb	0.48	879	1,476	1,678

Table 10.

U.C. COOPERATIVE EXTENSION  
 DETAIL BY OPERATIONS  
 INTERMOUNTAIN REGION  
 SHASTA & LASSEN COUNTIES – 2005

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Weed Control - Borders 10% Acres	April	ATV	100 Gal ATV Sprayer with Boom	Roundup Ultra Max	0.40	Lb
	September	ATV	100 Gal ATV Sprayer with Boom	Roundup Ultra Max	0.40	Lb
Border Maintenance/Repairs	April	Backhoe				
Fertilize - Urea @ 68 Lbs N/Acre 2X	May	55 HP 2WD Tractor	Mower - Flail 10'	Urea	115.00	Lb N
	June	Labor		Water	3.00	AcIn
Flood & Maintain Water	May	Labor		Water	14.00	AcIn
	June	Labor		Water	12.00	AcIn
	July	Labor		Water	12.00	AcIn
	August	Labor		Water	6.00	AcIn
Bird Control - Zon Guns	May	Labor		Propane	0.25	Gal
Bird Control	May	Labor		Shotgun Shells	1.00	Box
	July	Labor		Shotgun Shells	2.00	Box
		Labor		Bird Screamer	0.25	Each
	August	Labor		Shotgun Shells	3.00	Box
		Labor		Bird Screamer	0.25	Each
Algae Control - 50% of Acres	June	Custom	Air Application	Copper Sulfate	5.00	Lb
Tissue Sample	July	Custom		Tissue Analysis	1.00	Acre
Combine Rice	August	Custom		Combine Wild Rice	1.00	Acre
Haul To Coop	August	Truck - 2.5 Ton 2WD	Rice Bins (8)			
Assessments	August			Wild Rice Marketing Order	1.00	Acre
				Wild Rice Coop Annual Fee	1.00	Acre
Disc Stubble 2X	September	165 HP 4WD Tractor	Disc Stubble 14'			
Flood Wet/Seal Field	September	Labor		Water	6.00	AcIn
Pickup Truck Use	All Months					
ATV Use	All Months					