

1999

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS TO PRODUCE

~ *WINTER FORAGE* ~



SAN JOAQUIN VALLEY

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San Joaquin Valley

INTRODUCTION

The detailed costs to produce winter forage in San Joaquin Valley of California are presented in this study. The hypothetical farm used in this report consists of 300 acres of which 150 acres of winter forage production double cropped with corn silage.

This study consists of Assumptions for producing winter forage and seven tables. It is intended as a guide only. It can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to every situation. A blank, *Your Cost*, column is provided to enter your actual costs on Table 1 Costs Per Acre to Produce Winter Forage and Table 2 Costs and Returns Per Acre To Produce Winter Forage.

Tables included:

Table 1.	Costs Per Acre To Produce Winter Forage
Table 2.	Costs And Returns Per Acre To Produce Winter Forage
Table 3.	Monthly Cash Costs Per Acre To Produce Winter Forage
Table 4.	Whole Farm Annual Equipment, Investment And Business Overhead Costs
Table 5.	Hourly Equipment Costs
Table 6.	Ranging Analysis
Table 7.	Costs And Returns/Breakeven Analysis

For an explanation of calculations used for the study refer to the attached General Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call the farm advisor in your county.

Other small grain, silage, and forage crop cost studies are available for commodities grown in the San Joaquin Valley. For those interested in this and other studies, they can be requested through the Department of Agricultural Economics, U.C. Davis, (530) 752-3589 or (530) 752-1515, or from selected county Cooperative Extension offices. There is a nominal charge.

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ASSUMPTIONS

Land and Share Rent. This report is based on a 300 acre farm of which 150 acres are producing winter forage double cropped with corn silage and the remaining 150 acres are planted to other crops.

Land in this study is leased on a cash-rent basis with the land owner receiving \$125 per acre. The land rented includes developed wells and irrigation system. The grower owns a shop and an equipment yard to fix and store equipment. Land rent appears as a cash overhead cost in Tables 1-4.

Irrigation System. An irrigation district supplies water, though growers may supplement this with well water in some areas. The amount of water used to irrigate winter forage will vary in the San Joaquin Valley. Irrigation districts in the Valley were surveyed for water pricing and the cost of pumping well water was calculated. District and well water costs were combined to obtain an average cost for water. The cost of irrigation water for this cost study is \$2.20 per acre-inch or \$26.40 per acre-foot.

The permanent irrigation system consists of buried mainline. This part of the system is already in place when the land is purchased. The cost of the irrigation system is included in the of land rent which is shown in Business Overhead Costs on Table 4.

Labor. Basic hourly wages for workers are \$8.21 per hour for machine operators and \$5.75 per hour for non-machine workers. Adding 34% for SDI, FICA, insurance and other benefits raises the total labor costs to \$11.00 per hour for machine operators and \$7.71 per hour non-machine labor. The labor for operations involving machinery is 20% higher than the operation time to account for the additional time involved in equipment set up, moving, maintenance and repair.

Production Cultural Practices and Material Inputs

Tables 1-3 show the costs associated with ground preparation, planting, growing, and harvesting winter forage. Field preparations begin in the early fall and the crop is harvested in April of the following year.

Land Preparation. Land preparations begins with an application of five tons of manure per acre by a supplier. The fields are disced twice to incorporate the manure and to prepare a better

seedbed. Borders are pulled creating a basin for irrigation and eight acre-inches of water is run to pre-irrigate the fields just prior to planting.

Subsoiling, discing, pulling and knocking down borders are performed with a either a 200 or 130 hp wheel tractor. Planting, application of herbicides, and harvest operations are contracted with a commercial companies or suppliers.

Planting. The winter forage mix includes oats, wheat, and barley and is planted at a rate of 120 pounds per acre on flat ground. Planting normally occurs in fall and in this study seed is drilled in October. Custom rate for planting is \$11 per acre.

Fertilization. Growers should apply fertilizer or soil amendments only after soil tests determine unacceptable nutrient and pH levels. In February urea is applied at a rate of 60 pounds per acre of nitrogen. Phosphorous and/or sulfur may need to be applied preplant in deficient areas of the San Joaquin Valley, particularly the eastside of Stanislaus and Merced Counties.

Irrigation. The price of irrigation includes water cost and labor expense. A preplant irrigation of 7 acre-inches is made in October. The amount of water applied preplant will vary depending on soil moisture from rainfall or remaining from the previous crop. A single irrigation is made in spring putting seven acre-inches of water onto the fields.

Weed Control. Weed control consists of a post-emergent herbicide (Buctril®) applied by air in January to maintain weed control until harvest.

The pesticides and rates mentioned in this cost study are a few of those that are listed in the U.C. Pest Management Guidelines, Wheat and Integrated Pest Management For Small Grains. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. Contact your local farm advisor for advice on production practices.

Equipment Cash Costs. Equipment costs are fall into three categories; capital recovery, cash overhead, and operating costs. The cash overhead and capital recovery costs will be discussed in later sections. The operating costs consist of fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time (Operation Time) for a given operation to account for fueling, moving equipment, and setup time. Prices for on-farm delivery of diesel and gasoline are \$0.62 and \$1.02 per gallon, respectively.

Harvest. In this study, winter forage is harvested in April. The grower has the forage custom swathed, chopped, hauled, and packed. A custom harvesting company charges \$10 per acre for

swathing the crop. The forage mix is allowed to wilt to about 70% moisture before the custom harvester chops, hauls, and packs the forage into a silage pit. A rate of \$5.75 per ton for chopping, hauling, and packing is used in this study. Because of its bulk and weight, winter forage is usually grown and sold to nearby dairies to reduce hauling costs.

All harvest operations are hired out to a custom harvester. Since the farm custom harvests its winter forage, there are no ownership costs for equipment. If a grower harvests winter forage using their own equipment, harvest expense (custom harvest costs) should be subtracted from harvest costs in Tables 1, 2, and 3. The cash cost for operating grower owned equipment would be added to harvest costs in Tables 1, 2, and 3.

Growers may choose to own harvest equipment purchased either new or used, or hire a custom harvester to perform the harvest. Many factors are important in deciding which harvesting option a grower uses. These considerations and appropriate method of analysis are discussed in "Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis Of Alternatives".

Yields. The crop is assumed to yield 12 tons of winter forage per acre. Individual yields can vary in this region depending on the kind of forage and growing conditions.

Returns. An estimated price of a \$17 per ton of silage is used to calculate returns above several levels of cost. Selling prices may range from \$14 to \$20 per ton; the \$17 used in the cost study is, at best, an estimate taking into consideration current situations. Table 6 indicates the effects on grower returns based on varying yields and returns. Breakeven points based on estimated costs are calculated for both yields and return prices in Table 7.

Risk. The risks associated with producing and marketing winter forage are significant. 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 winter forage production. A market channel should be determined before forage is planted and brought into production. Though, not used in this study, crop insurance is a risk management tool available to growers.

Overhead Costs

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and investment repairs. Cash overhead costs are included in Tables 1, 2, 3, and 4.

Property Taxes. Counties charge a base property tax at the rate of 1% on the assessed value of the property including land, equipment, buildings, and improvements. In some counties special assessment districts exist and charge additional taxes on property. 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. Land value is assumed to remain unchanged.

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 9.69% per year. This interest rate is the going market cost of borrowed funds. The cost of postharvest operations are discounted back to the harvest month using a negative interest charge.

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 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$684 for the entire farm or \$2.28 per acre.

Office Expense: Office and business expenses are estimated at \$25 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Capital Recovery Costs. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. This study shows the current purchase price for new equipment and then adjusts the price to 60% of new cost to indicate a mix of new and used equipment. Annual ownership costs for equipment and investments are shown in Tables 1, 2, 4, and 5 as the capital recovery cost 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 price and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the downpayment 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 annual capital recovery costs is as follows.

$$\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Recovery Factor}} \times \text{Capital} + \frac{\text{Salvage Value} \times \text{Interest Rate}}$$

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. Salvage value for investments can vary. The purchase price and salvage value for certain equipment and investments are shown in Table 7.

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 7.40% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector long-run real 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, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Acknowledgment. Appreciation is expressed to the cooperators who provided additional information for this study.

REFERENCES

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- Blank, Steve, Karen Klonsky, Kim Norris, and Steve Orloff. 1992. *Acquiring Alfalfa Hay Harvest Equipment: A Financial Analysis Of Alternatives*. University of California. Oakland, California. Giannini Information Series No. 92-1.
- Integrated Pest Management Education and Publications. 1990. *U.C. Pest management guidelines, Wheat*. In M. L. Flint (ed.) UC IPM pest management guidelines. University of California. Division of Agriculture and Natural Resources. Oakland, California. Publication 3339.

Table 1.

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE WINTER FORAGE
 SAN JOAQUIN VALLEY - 1999

Labor Rate: \$11.00/hr. machine labor
 \$7.71/hr. non-machine labor

Interest Rate: 9.69%
 Yield per Acre: 12.0 Ton

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Apply Manure	0.00	0	0	0	100	100		
Finish Disc 2X	0.25	3	4	0	0	7		
Pull Borders	0.08	1	1	0	0	2		
Pre-irrigate	0.20	2	0	15	0	17		
Knock Down Borders	0.08	1	1	0	0	2		
Plant	0.00	0	0	32	11	43		
Fertilize - Topdress 60 Lbs N/Acre	0.00	0	0	10	8	18		
Weed Control - Post-emergent	0.00	0	0	8	0	8		
Irrigate	0.20	2	0	15	0	17		
Pickup Truck Use	0.24	3	1	0	0	4		
TOTAL CULTURAL COSTS	1.05	12	7	81	119	218		
Harvest:								
Swath & Wilt	0.00	0	0	0	10	10		
Harvest - Cut, Haul & Pack	0.00	0	0	0	66	66		
TOTAL HARVEST COSTS	0.00	0	0	0	76	76		
Interest on operating capital @ 9.69%							11	
TOTAL OPERATING COSTS/ACRE		12	7	81	195	306		

U.C. COOPERATIVE EXTENSION
Table 1. continued

CASH OVERHEAD:	
Liability Insurance	2
Office Expense	17
Rent	83
Property Taxes	1
Property Insurance	1
Investment Repairs	1

TOTAL CASH OVERHEAD COSTS	104

TOTAL CASH COSTS/ACRE 410

CAPITAL RECOVERY COSTS (7.40% Interest Rate):

Investment	Per producing Acre	-- Annual Cost -- Capital Recovery	
-----	-----	-----	-----
Fuel Tanks	19	2	2
Fuel Wagon	4	1	1
Shop Building	61	5	5
Shop Tools	19	2	2
Siphon Tubes	3	0	0
Equipment	54	7	7
	-----	-----	-----
TOTAL CAPITAL RECOVERY COSTS	161	16	16

TOTAL COSTS/ACRE 426

U.C. COOPERATIVE EXTENSION
Table 2. continued

CASH OVERHEAD COSTS:	
Liability Insurance	2
Office Expense	17
Rent	83
Property Taxes	1
Property Insurance	1
Investment Repairs	1

TOTAL CASH OVERHEAD COSTS/ACRE	104

TOTAL CASH COSTS/ACRE	410

CAPITAL RECOVERY COSTS (7.40% Interest Rate):	
Fuel Tanks	2
Fuel Wagon	1
Shop Building	5
Shop Tools	2
Siphon Tubes	0
Equipment	7

TOTAL CAPITAL RECOVERY COSTS/ACRE	16

TOTAL COSTS/ACRE	426

NET RETURNS ABOVE TOTAL COSTS	-222
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Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE WINTER FORAGE
SAN JOAQUIN VALLEY - 1999

Beginning OCT 98	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Ending SEP 99	98	98	98	99	99	99	99	99	99	99	99	99	

Cultural:													
Apply Manure	100												100
Finish Disc 2X	7												7
Pull Borders	1					1							2
Pre-irrigate	17												17
Knock Down Borders	1					1							2
Plant	43												43
Fertilize													
- Topdress 60 Lbs N/Acre					18								18
Weed Control - Post-emergent				8									8
Irrigate						17							17
Pickup Truck Use	0	0	0	0	0	0	0	0	0	0	0	0	4

TOTAL CULTURAL COSTS	170	0	0	8	18	19	0	0	0	0	0	0	218

Harvest:													
Swath & Wilt							10						10
Harvest - Cut, Haul & Pack							66						66

TOTAL HARVEST COSTS							76						76

Interest on oper. capital	1	1	1	1	2	2	2	-0	-0	-0	-0	-0	11

TOTAL OPERATING COSTS/ACRE	171	2	2	10	20	21	79	0	0	0	0	0	306

OVERHEAD:													
Liability Insurance				2									2
Office Expense	1	1	1	1	1	1	1	1	1	1	1	1	17
Rent							83						83
Property Taxes					1					1			1
Property Insurance					1								1
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	1

TOTAL CASH OVERHEAD COSTS	1	1	1	3	3	1	85	1	1	2	1	1	104

TOTAL CASH COSTS/ACRE	172	3	3	13	23	22	163	2	2	2	2	2	410
=====													

Table 4.

U.C. COOPERATIVE EXTENSION
 WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SAN JOAQUIN VALLEY - 1999

ANNUAL EQUIPMENT COSTS

=====								
- Cash Overhead -								
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Total

99	130 HP 2WD Tractor	90841	10	26833	11268	420	588	12276
99	200 HP Crawler	163020	10	48154	20221	753	1056	22030
99	Disc - Border	1035	12	143	125	4	6	135
99	Disc - Finish 18'	16088	12	2228	1947	65	92	2104
99	Pickup - 1/2 Ton	19305	5	8652	3266	100	140	3506
99	Rear Blade - 8'	2495	18	166	251	9	13	273

TOTAL		292784		86176	37079	1351	1895	40325
=====								
60% of New Cost *		175670		51706	22247	811	1137	24195

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

ANNUAL INVESTMENT COSTS

=====									
----- Cash Overhead -----									
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Repairs	Total

INVESTMENT									
	Fuel Tanks	8550	20	855	812	34	47	47	940
	Fuel Wagon	1975	10	198	272	8	11	40	331
	Shop Building	27450	25	27459	2031	196	275	150	2651
	Shop Tools	8500	20	850	808	33	47	47	935
	Siphon Tubes	1540	20	154	146	6	8	9	170

TOTAL INVESTMENT		48015		29516	4070	276	388	293	5027
=====									

U.C. COOPERATIVE EXTENSION

Table 4. continued

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	300.00	Acre	2.28	684
Office Expense	300.00	Acre	25.00	7500
Rent	300.00	Acre	125.00	37500

Table 5.

U.C. COOPERATIVE EXTENSION

HOURLY EQUIPMENT COSTS

SAN JOAQUIN VALLEY - 1999

Yr Description	Actual Hours Used	COSTS PER HOUR						Total Oper.	Total Costs/Hr.
		Capital Recovery	Cash Insur- ance	Overhead Taxes	Repairs	Operating Fuel & Lube			
99 130 HP 2WD Tractor	1173.4	5.76	0.21	0.30	4.04	5.38	9.42	15.70	
99 200 HP Crawler	1591.9	7.62	0.28	0.40	4.15	8.28	12.43	20.73	
99 Disc - Border	166.0	0.45	0.02	0.02	0.16	0.00	0.16	0.65	
99 Disc - Finish 18'	165.1	7.08	0.24	0.33	2.50	0.00	2.50	10.15	
99 Pickup - 1/2 Ton	184.9	10.60	0.32	0.45	1.24	2.93	4.17	15.55	
99 Rear Blade - 8'	166.0	0.91	0.03	0.05	0.36	0.00	0.36	1.35	

Table 6.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
SAN JOAQUIN VALLEY - 1999

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE WINTER FORAGE

	YIELD (TON/ACRE)						
	6	8	10	12	14	16	18

OPERATING COSTS/ACRE:							
Cultural Cost	218	218	218	218	218	218	218
Harvest Cost	43	54	65	76	87	98	109
Interest on operating capital	11	11	11	11	11	11	11
TOTAL OPERATING COSTS/ACRE	272	284	295	306	317	328	339
TOTAL OPERATING COSTS/TON	45	35	29	25	23	20	18.83
CASH OVERHEAD COSTS/ACRE	104	104	104	104	104	104	104
TOTAL CASH COSTS/ACRE	377	388	399	410	421	432	443
TOTAL CASH COSTS/TON	63	48	40	34	30	27	25
CAPITAL RECOVERY COSTS/ACRE	16	16	16	16	16	16	16
TOTAL COSTS/ACRE	393	404	415	426	437	448	460
TOTAL COSTS/TON	66	51	42	36	31	28	26

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WINTER FORAGE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	6	8	10	12	14	16	18
Winter Forage	6	8	10	12	14	16	18
14.00	-188	-172	-155	-138	-121	-104	-87
15.00	-182	-164	-145	-126	-107	-88	-69
16.00	-176	-156	-135	-114	-93	-72	-51
17.00	-170	-148	-125	-102	-79	-56	-33
18.00	-164	-140	-115	-90	-65	-40	-15
19.00	-158	-132	-105	-78	-51	-24	3
20.00	-152	-124	-95	-66	-37	-8	21

U.C. COOPERATIVE EXTENSION
Table 6. continued

NET RETURNS PER ACRE ABOVE CASH COSTS FOR WINTER FORAGE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Winter Forage	6	8	10	12	14	16	18
14.00	-293	-276	-259	-242	-225	-208	-191
15.00	-287	-268	-249	-230	-211	-192	-173
16.00	-281	-260	-239	-218	-197	-176	-155
17.00	-275	-252	-229	-206	-183	-160	-137
18.00	-269	-244	-219	-194	-169	-144	-119
19.00	-263	-236	-209	-182	-155	-128	-101
20.00	-257	-228	-199	-170	-141	-112	-83

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR WINTER FORAGE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Winter Forage	6	8	10	12	14	16	18
14.00	-309	-292	-275	-258	-241	-224	-208
15.00	-303	-284	-265	-246	-227	-208	-190
16.00	-297	-276	-255	-234	-213	-192	-172
17.00	-291	-268	-245	-222	-199	-176	-154
18.00	-285	-260	-235	-210	-185	-160	-136
19.00	-279	-252	-225	-198	-171	-144	-118
20.00	-273	-244	-215	-186	-157	-128	-100

Table 7.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS / BREAKEVEN ANALYSIS
 SAN JOAQUIN VALLEY - 1999

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)
Winter Forage	204	306	-102	410	-206	426	-222

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)
Winter Forage	30600	45854	-15254	61490	-30890	63943	-33343

U.C. COOPERATIVE EXTENSION
Table 7. continued

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 -----					
Winter Forage	12.0	Ton	25.47	34.16	35.52
=====					

BREAKEVEN YIELDS PER ACRE

=====					
CROP	Yield Units	Base Price (\$/Unit)	----- Breakeven Yield To Cover -----		
			Operating Costs	Cash Costs	Total Costs

----- Yield Units / Acre -----					
Winter Forage	Ton	17.00	18.0	24.1	25.1
=====					