

EconS 450
Midterm Exam I
February 16, 2010
150 Total Points
(Question points are in parenthesis.)

Name _____

Show ALL work on ALL problems to receive full credit.

1. Farmer Jake has asked for your help in computing the costs of his new grain truck. He has some records (see Table 1). Table 1 contains some data that you won't need. Some data might require additional computations.

Table 1.

Item	Data
Purchase price: Truck	\$55,000
Diesel price	\$3.40/gallon
Av. fuel/use per hour	4 gallons/hr.
Property taxes/yr. on truck	0.1% of purchase price
Interest rate	8%
Combine's acres/hour while harvesting	4 ac./hr.
Acres to be harvested/yr. on the farm	1,500 ac.
Salvage value of truck	\$4,000
Truck use per year	Equals combine harvesting hrs. for farm
Labor cost/hr. (truck driver)	\$12/hr.
Truck repairs & maintenance per year	\$600/yr.
Nitrogen application rate for wheat	120 lbs./ac.
Housing and insurance for truck	\$400/yr.
Useful life of truck	20 yrs.

(10) a. Compute the fixed costs **per year** for the truck using traditional (not CRC, see (c.) below) methods. Show your work for full credit.

(10) b. Compute the variable costs **per year** of the truck based on the data in Table 1. Show your work for full credit.

(10) c. Compute depreciation and interest **per year** for the truck using the CRC method. Show your work for full credit.

(10) **2.** A rancher expects to achieve a 94% weaning rate per cow bred (i.e., out of 100 cows bred, 94 will have a calf to sell). The annual cost per bred cow is \$500. The average price received for the calves is \$1.05/lb. Compute the rancher's breakeven weaning weight per calf. Show your work.

(10) **3.** Accumulated costs for establishing an apple orchard are \$28,500 per acre. Assuming a 6% annual interest rate and a tree life of 22 years, compute the annual amortized charge per acre. Show all work.

4. Consider the Garbanzo Bean budget in Table 2 (next page).
- (4) a. Given a total yield of 1,200 lbs/acre and a selling price of \$0.38/lb, determine Gross Revenue and Net Returns above Variable Costs. Place these numbers in Table 2.
- (6) b. Assume you lease the land, with 33% of the crop going to the lessor and with the lessor paying 33% of fertilizer, pesticides, and fungicide. Compute the Land Cost and place under the Fixed Costs. Compute Total Fixed Costs, Total Costs per Acre, and Net Returns.
- (5) c. Define Net Returns as it applies to this enterprise budget (i.e., Returns to what?).
- (5) d. Given the farmer expects to harvest 1,200 lb/ac of Garbanzo Beans, compute the farmer's breakeven price/lb to cover the total cost/ac as figured above.
- (5) e. Assume the farmer has contracted the beans for \$0.38/lb. Compute the farmer's breakeven yield in lb/ac.

Table 2. Production Costs for Reduced Tillage Garbanzo Beans.

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
Gross Returns				
Garbanzos	_____	lb	\$_____	\$_____
Variable Costs				
Seed:				\$58.50
Garbanzo Seed	130	lb	\$0.45	\$58.50
Fertilizer:				\$0.00
Pesticides:				\$27.50
Roundup	18	oz	\$0.39	\$7.02
Pursuit	3	oz	\$4.15	\$12.45
Prowl	24	oz	\$0.25	\$6.00
Ammonium Sulfate	100	oz	\$0.02	\$2.00
M90	3	oz	\$0.01	\$0.03
Fungicide:				\$17.84
Quadris	8	oz	\$2.23	\$17.84
Machinery:				\$26.24
Fuel	5.42	gal	\$2.50	\$13.55
Lubricants	1	acre	\$3.96	\$3.96
Machinery Repairs	1	acre	\$8.74	\$8.74
Labor:				\$20.00
Hired Labor	0.95	acre	\$20.00	\$18.90
Custom & Consultants:				\$10.00
Rental Sprayer	2	acre	\$1.75	\$3.50
Custom Aerial Spray	1	acre	\$6.50	\$6.50
Other:				\$4.54
Crop insurance	1	acre	\$4.54	\$4.54
Overhead ¹				\$5.92
Operating Interest ²				\$4.44
Total Variable Costs				\$220.13
Net Returns Above Variable Costs				\$_____
Fixed Costs:				
Machinery depreciation				\$18.88
Machinery interest				\$10.79
Machinery insurance, taxes, housing, licenses				\$4.40
Land Cost*	1	acre		\$_____
*Based on Share Rent Percentage:				
Landlord	33.00%			
Tenant	67.00%			
Total Fixed Costs				\$_____
Total Costs per Acre				\$_____
Returns to ???				\$_____

Notes:

¹Covers legal, accounting, and utility fees. Calculated as 5% of operating expenses.

²Calculated as 7% interest on operating capital for 6 months.

5. Use the following machinery cost analysis for a combine to answer (5a) and (5b).

Machinery Cost Analysis

Power Unit self-propelled combine	
<u>Input Parameters:</u>	
Purchase Price	178000.00
List Price	178000.00
Annual Farm Use (hours)	200
Age When Purchased (years)	0.00
Ownership Period (years)	10.00
Operator Labor (\$/hour)	11.70
Taxes, Housing, Insurance, License (% of average investment)	2.60
Total Annual Repair Costs	3100.00
Salvage Value	35000.00
Field Speed (mph)	3.00
Width (feet)	25.00
Field Efficiency	70.00
Acres per Hour	6.36 *
Diesel Fuel Use (gallons/hour)	7.00
Diesel Fuel Cost (\$/gallon)	2.50
Interest Rate (%)	7.00

* Values calculated by the Machinery Cost Analysis program.

Power Unit self-propelled combine		
	\$/hour	\$/acre
<u>Ownership Costs:</u>		
Depreciation	71.50	
Interest	37.28	
Taxes, Housing, Insur., Lic.	13.85	
Total Ownership Costs	122.63	
<u>Operating Costs:</u>		
Repairs & Maintenance	15.50	
Fuel	17.50	
Lubricants	2.63	
Total Operating Costs	35.63	
Labor	14.04	
Labor + Operating Costs	49.67	
Total Cost	172.30	

University of Idaho Machinery Cost Analysis
Version 1.30
<http://www.ag.uidaho.edu/aers>

- (10) a. Determine labor + operating cost per acre, total ownership cost per acre, and total cost per acre. Show all work.

(10) b. Assume the custom combine rate is \$20.00 per acre. Further assume that total annual fixed costs for the combine are \$35,000. Using information determined in (a) above, determine the breakeven acreage required before it is profitable to purchase your own combine. Show all work.

(10) 6. Assume wheat production operating costs are \$275/acre. The operating loan to finance these costs is outstanding for 5 months and the annual interest rate for the operating loan is 7.5%. Compute annual operating loan interest per acre on operating costs. Show all work.

7. You own a 500 doe dairy goat operation. You value the does at \$120 each with a salvage (cull) value of \$56 each. You need 10 buck goats for your dairy, with each buck costing \$400, with a useful life of five years and a salvage value of \$80. Assume an interest rate of 9%.

(10) a. Determine the total annual depreciation and interest from your 10 bucks using the CRC method.

(10) b. Determine the total annual investment charge for your 500 does.

8. Assuming a 10% return on investment opportunity cost....

(5) a. What cost would you place on land in a wheat enterprise budget that was valued at \$5,000 per acre?

(5) b. State the possible danger in using the method in (a) above for valuing land.

(15) 9. Assume you have 100 head of beef cows. Assume they calve 50% male and 50% female calves. Eighty percent of the bred cows wean a calf, with weaned steers weighing 600 lbs and weaned heifers weighing 500 lbs, and with all steers and heifers sold at weaning. Assume you cull (sell) 10 cows per year that weight an average of 1,200 lbs each, and one bull each year that weighs, on average, 2,200 lbs. Average prices are as follows: steer calves, \$1.04/lb; heifer calves, \$0.98/lb; cull cows and bulls, \$0.53/lb. Further, assume you sell all your heifer calves at weaning and purchase replacements for the cows you cull.

Allocate **returns** to the beef enterprise (all lines need not be used):

Item	Number	Weight	Price/lb	Total \$	\$ per Cow
Total Returns				?	?