

**Lab 9**  
**Agricultural and Resource Economics**  
**(ARE 012)**

Name: \_\_\_\_\_

Section #: \_\_\_\_\_

This lab assignment is worth 100 points. Unless instructed differently, you are to complete the lab during the lab period. Late lab assignments will not be accepted without an excused absence. Please let the lab instructor know if you need any help with this lab. Good Luck!

**Purpose of Lab:**

This assignment will teach you how to calculate the ownership and operating costs of capital goods.

**Assignments:**

**I. Calculating Ownership and Operating Costs of Capital Goods.** The ownership and operating costs of capital goods are useful and important in making business decisions. For example, a golf course superintendent needs an estimate of the ownership and operating costs of a greens mower when he or she is planning the golf course's budget.

The annual ownership cost of a capital good is calculated as follows:

$$\begin{aligned} \text{Annual Ownership Cost} = & \text{Annual Depreciation Cost} \\ & \text{Plus Annual Interest Cost} \\ & \text{Plus Annual Insurance Cost} \\ & \text{Plus Annual Property Taxes} \end{aligned}$$

where,

$$\text{Annual Depreciation Cost} = \frac{\text{Cost} - \text{Salvage Value}}{\text{Useful Life}}$$

$$\text{Annual Interest Cost} = \frac{(\text{Cost} + \text{Salvage Value})}{2} \times \text{Interest Rate}$$

$$\text{Annual Insurance Cost} = \frac{(\text{Cost} + \text{Salvage Value})}{2} \times \text{Insurance Rate}$$

$$\text{Annual Property Taxes} = \frac{(\text{Cost} + \text{Salvage Value})}{2} \times \text{Tax Rate}$$



3. What is the estimated annual insurance cost on the tractor?

4. What is the estimated property tax on the tractor?

5. What is the estimated annual ownership cost of the tractor?

6. Let's suppose that you will use your tractor 600 hours per year. Under these circumstances, what is the estimated ownership cost of the tractor per hour?

7. The cost of fuel, oil, repairs, and maintenance for your tractor is \$3.50 per hour of operation. The wage rate for a farm worker is \$9.00 per hour. Under these circumstances, what is the operating cost of your tractor per hour?

8. What is the annual operating cost of your tractor?

9. What is the estimated annual ownership and operating cost of your tractor?

10. What is the estimated ownership and operating cost of your tractor per hour?

**Please answer the questions below using the following information. You may want to refer to your notebook and lecture notes.**

Let's suppose that you have just purchased a four-row cotton picker for \$200,000. The salvage value of the cotton picker is \$39,105. The useful life of the cotton picker is 10 years. We will assume that the nominal interest rate is 9.5%, the insurance rate is \$8.50 per \$1,000 in value, and the property tax rate is \$.78 per \$100 in value.

You plan to use the cotton picker 325 hours per year. The cost of fuel, oil, repairs, and maintenance is \$58.25 per hour of operation. You will pay a farm worker \$10.50 per hour to operate the cotton picker.

The average performance rate for the cotton picker is .295 hours per acre. It is equal to the inverse of the physical efficiency of the cotton picker.

1. What is the estimated ownership and operating cost of the cotton picker per hour?

2. How many acres of cotton do you plan to harvest per year?

3. What is the estimated ownership and operating cost of the cotton picker per acre?

**Please answer the questions below using the following information. You may want to refer to your notebook and lecture notes.**

Let's suppose that you have just purchased an orchard sprayer for \$2,700. You will use the sprayer in your field nursery. The salvage value of the sprayer is \$350. The useful life of the sprayer is 10 years. We will assume that the nominal interest rate is 9.75%, the insurance rate is \$8.75 per \$1,000 in value, and the property tax rate is \$.85 per \$100 in value.

You will use the sprayer 150 hours per year. The cost of repairs and maintenance is \$1.20 per hour of operation. The performance rate of the sprayer is .420 hours per acre. You will use the sprayer with the 35-hp diesel tractor discussed in problem 1. The wage rate for tractor driver is \$9.00 per hour.

1. What is the estimated ownership and operating cost of the sprayer per hour?

2. What is the estimated ownership and operating cost of the tractor and sprayer per hour?  
You will have to refer to problem 1 to answer this question.

3. How many acres do you plan to spray per year?

4. What is the estimated ownership and operating cost of the tractor and sprayer per acre?