**EconS 450 Assignment #2 (50 points)**
**Machinery Costs**
**DUE: February 6, 2012**

1. Determine a farming or ranching enterprise you wish to adopt for this and several subsequent assignments. Precisely specify the enterprise and its location. For example, "300 acres no-till winter wheat following spring barley in Columbia County", "160 acres of Russet Burbank potatoes under center pivot irrigation in Grant County, WA." or "Forty pair Angus-Hereford cow-calf operation on dry pasture and wheat stubble in Lincoln County." or "A 20-horse stable and training facility in King County." or "Commercial dairy heifer raising operation in Yakima County" or "Machine shop for fabricating no-till drills." Also devote a paragraph to explaining why you have selected this enterprise.

2. Select a machine operation needed for the enterprise you selected. Identify the overall size of the operation (this need not be an actual farm, but may be). The operation you choose should involve an implement and a power unit (such as a drill and a tractor, pickup truck and a gooseneck trailer, tractor and a plow, etc.). If you can't think of an operation involving a power unit and an implement, do this assignment for two self-propelled operations such as a combine, swather, truck, pickup, etc. The calculations you do here will feed into your larger Assignment # 2. Initially complete parts A and B below by hand or spreadsheet.

   A. Include complete descriptions of the size and type of each machine. Then present the *data* you need to compute the fixed and variable (ownership and operating) costs for your machine(s) in neat (preferably typed) tables. Label your units of measurement for each data item (for example life (years), repairs ($/year), diesel cost ($/gallon), etc. For the data items you need to compute fixed and variable costs, see your class notes.

      For items like fuel use per hour, operation speed, hours annual use, machine input purchase prices, input prices, etc. you can use data either from a farm you are familiar with or data from a published source. Feel free to interview relatives, friends, prior employers, machinery dealers, or others. Alternatively, use data from newspapers or one of the budgets from the internet. In either case, list in your tables the source of your data. You are responsible for coming up with realistic data. For example, a source of current interest rates could be a local bank, farmer, business person, newspaper, or web page.

   B. Compute the *fixed* (ownership), *variable* (operating) and *total* costs of your operation(s) *per year* **and** *per acre* or *per hour* where possible. Compute costs per hour for pickup, truck, or other non field operation where cost per acre doesn't make sense. Of course, you will sometimes need to compute per hour costs as an intermediate step in computing per acre costs. Hint: Fixed machine costs equal "DITHI Five." Machine variable costs= "FLRML Five" (fuel, lube, repairs, materials and labor).

Neatly *show your calculations* (by hand or spreadsheet) for each component of fixed and variable costs. Note that you will have costs for a power unit and implement for an operation that involves both. Of course some costs like fuel might not apply to both machines. Double-check your data entries and calculations. This exercise requires some careful arithmetic by calculator or spreadsheet. Make the calculations clear enough that a bank loan officer with limited experience with your enterprise could follow them. Total annual use and other data should make sense for the size and type of farm and enterprise you are assuming. Total hours use will depend on all the enterprises on the farm, not just your chosen enterprise.

3. Compute the same machinery costs for your machine(s) analyzed in question #1 using the MACHCOST program available in the computer lab (Hulbert 5 and 21). Run MACHCOST for your machines and submit your output. The cost equations programmed in MACHCOST are listed in the class notes and can be accessed in MACHCOST under the **Help** tab. Instruction in use of MACHCOST will be provided as needed.

   It is essential that you insert the same data (interest rates, prices, etc.) in MACHCOST as you used in your analysis in part 1 above. Be sure to access the "Fuel, labor, and interest parameters" item in MACHCOST to insert the correct information for these inputs. You will need to make some straight forward calculations to prepare some input data for MACHCOST; for example, divide fuel cost per hour by your price per gallon to obtain gallons per hour.

   You should obtain *generally similar* answers on both questions #1 and #2 (assuming no errors in either), but some items will differ due to different assumptions. Don't expect to get identical answers. Construct a table comparing your fixed, variable, and total costs per acre (or per hour) to those obtained from MACHCOST. If there are really large differences you should check your work and input for both approaches. Make sure you have included all components listed in the MACHCOST output in your part 1 calculations. Turn in your final output page from MACHCOST together with your answers for part 1.