

FOR 373/573

Exercise -- MACHINE RATES

PURPOSE:

Assess student understanding of machine rate calculations.

PROCEDURE:

A logging contractor must replace an aging grapple skidder currently used in his harvesting operation. He is considering the purchase of either a John Deere model JD-640 or a Timberjack model TJ-380.

He expects the productivity for both machines to be approximately the same with 26 turns per day averaging 0.80 cords per turn. Regardless of which machine is selected, the skidder is expected to work 240 days per year. Scheduled operating time is 10 hours per day. Data of interest for each machine is as follows:

JD-640:

110 HP, diesel, 4 W-D, shipping weight 24,500 lbs.

Purchase Price (without grapple): \$120,000 F.O.B. delivered

Extra attachments (grapple): \$15,700

Sales Tax: 7%

Repair & Maintenance: 65% of depreciation

Insurance: 6% of AFI

Taxes: 3% of AFI

Interest: 12% of AFI

Diesel: \$4.00/gallon

Fuel consumption: 3.80 gallons/hour

Engine oil: \$5.00/quart

Oil consumption: 0.33 quarts/hour

Hydraulic oil: \$19.50/gallon

Hydraulic oil consumption: 0.05 gallons/hour

Lubricating grease: \$3.75/pound

Grease consumption: 0.5 pounds/8-hours

Salvage Value: 20%

Mechanical Availability: 75%

Utilization: 68%

Economic Life: 5 years

Labor: \$14.00/hour and 81% fringes (SS, WC, etc.)

Tire replacement cost: \$1500 per tire

Tire life: 5000 hours

TJ-380:

136 HP, diesel, 4 W-D, shipping weight 18,000 lbs., 10 gallon crankcase capacity, 120 hrs between oil changes

Purchase Price (without grapple): \$112,000 F.O.B. factory

Extra attachments (grapple): \$14,500

Sales Tax: 7%

Freight Cost: \$0.07/pound

Repair & Maintenance: 60% of depreciation

Insurance: 6% of AFI

Taxes: 3% of AFI

Interest: 8% of AFI

Diesel: \$4.00/gallon

Engine oil: \$20.00/gallon

Salvage Value: 20%

Mechanical Availability: 80%

Utilization: 68%

Economic Life: 5 years

Labor: \$14.00/hour and 81% fringes (SS, WC, etc.)

Tire replacement cost: \$1500 per tire

Tire life: 5000 hours

1. Based on the assumptions stated for each machine, use the machine rate method to derive the following for each grapple skidder:

- (a) Total cost per scheduled hour
- (b) Total cost per productive hour
- (c) Total cost per cord

2. Compare the cost estimates and determine which skidder the logging contractor should purchase on the basis of your machine rate calculations.