Farm Machinery Cost per Hour and per Hectare

Fixed and operating cost of a tractor or farm machine per hour and per hectare: depreciation, interest, insurance and shelter, repairs, fuel and labour.

Method: Machinery cost accounting

Input parameters

Unit system: SI

Parameter	Value	Unit
Purchase price	800,000	
Salvage value	160,000	
Life (years)	10.000	
Use per year (hours)	800.00	
Interest rate	10.000	%
Taxes, insurance and shelter per year (share of price)	2.0000	%
Repairs per year (share of price)	5.0000	%
Fuel use (litres per hour)	5.0000	
Fuel price per litre	90.000	
Operator cost per hour	150.00	
Effective field capacity	0.80000	ha

Calculated results

Parameter	Value	Unit
Fixed cost per hour	160.00	
Operating cost per hour	650.00	
Total cost per hour	810.00	
Cost per hectare	1,012.5	

Notes for this case

- Fixed costs (straight-line depreciation, interest on the average investment (P + S)/2, taxes, insurance and shelter) accrue whether or not the machine works, so they fall per hour as annual use rises. Operating costs (repairs, fuel, lubrication and operator) follow the hours worked. Dividing the hourly cost by the effective field capacity gives the cost per hectare, the figure to compare with custom hire rates.

Formula and method

$$c_{fix} = \frac{(P - S)/L + i(P + S)/2 + f_{TIS}P}{H}, \quad c_{op} = \frac{f_r P}{H} + q_f c_f + c_l, \quad c_{ha} = \frac{c_{fix} + c_{op}}{C_e}$$

Variables

P	Purchase price	-
S	Salvage value	-
L	Life (years)	-
H	Use per year (hours)	-
i	Interest rate	-
f_{TIS}	Taxes, insurance and shelter per year (share of price)	-
f_r	Repairs per year (share of price)	-
q_f	Fuel use (litres per hour)	-

c_f	Fuel price per litre	-
c_l	Operator cost per hour	-
C_e	Effective field capacity	m²
c_{fix}	Fixed cost per hour	-
c_{op}	Operating cost per hour	-
c	Total cost per hour	-
c_{ha}	Cost per hectare	-

Method and standards

Machinery cost.

Assumptions and limits

- Straight-line depreciation; constant annual use.

References

Machinery cost accounting

Report details

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Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/irrigation-farm/farm-machinery-cost-per-hour

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.