Field Capacity of Farm Machines and Time for a Field

Theoretical and effective field capacity of a tractor implement or harvester from width, speed and field efficiency, and the time to cover a field.

Method: Field capacity and field efficiency

Input parameters

Unit system: SI

Parameter	Value	Unit
Working width	2.0000	m
Travel speed	6.0000	km/h
Field efficiency (turning, filling, overlaps)	75.000	%
Field area	5.0000	ha

Calculated results

Parameter	Value	Unit
Theoretical field capacity	1.2000	ha
Effective field capacity per hour	0.90000	ha
Time to cover the field	5.5556	h

Notes for this case

• A machine covers width × speed of ground per unit time; in ha/h that is w (m) × v (km/h)/10. Turning at headlands, filling seed or fertiliser, unloading grain and overlapping passes reduce this to the effective capacity: typical field efficiencies are 70–90 % for tillage, 60–80 % for seeding and spraying, and 60–75 % for combine harvesters. Outputs show hectares covered per hour.

Formula and method

$$C_t = w\,v, \quad C_e = w\,v\,E_f \quad \left(\text{ha/h} = \frac{w[\text{m}]\,v[\text{km/h}]\,E_f}{10}\right), \quad t = \frac{A}{C_e}$$

Variables

w	Working width	m
v	Travel speed	m/s
E_f	Field efficiency (turning, filling, overlaps)	-
A	Field area	m²
C_t	Theoretical field capacity	m²
C_e	Effective field capacity per hour	m²
t	Time to cover the field	s

Method and standards

Field capacity.

Assumptions and limits

- Constant speed and width.

References

Field capacity and field efficiency

Report details

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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

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/field-capacity-machine

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.