

ASAE S495 DEC99

Uniform Terminology for Agricultural Machinery Management



American Society of Agricultural Engineers

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Developed by the ASAE Farm Machinery Management Committee; approved by the Power and Machinery Division Standards Committee; adopted by ASAE June 1969 as ASAE S322; reconfirmed December 1974, December 1979; revised December 1983; reconfirmed December 1988; revised March 1990 and redesignated ASAE S495; reaffirmed December 1994; reaffirmed for one year December 1999.

1 Purpose and scope

1.1 This Standard is intended to establish uniform use of machinery management terms.

2 Terms used primarily for system analysis

2.1 Efficiency

2.1.1 **Field:** Ratio of effective field capacity to theoretical field capacity, expressed in percent.

2.1.2 **Functional:** Ratio of the actual effectiveness of a machine to its theoretical effectiveness, expressed in percent. Threshing efficiency of a combine is an example of a functional efficiency.

2.2 Field capacity

2.2.1 **Effective:** Actual rate of land or crop processed in a given time.

2.2.2 **Theoretical:** Rate of performance obtained if a machine performs its function 100% of the time at a given operating speed using 100% of its theoretical width.

2.3 **Field speed:** Average rate of machine travel in the field during an uninterrupted period of functional activity. For example, functional activity would be interrupted when the implement is raised out of the soil.

2.4 **Field time:** The time a machine spends in the field measured from the start of functional activity to the time the functional activity for the field is completed.

2.5 **Life of machine, economic:** The useful service life of a machine before it becomes unprofitable for its original purpose due to obsolescence or wear.

2.6 **Load factor, field:** The ratio of engine power used in performing an operation to engine power available.

2.7 Management phases

2.7.1 **Planning:** Defining an objective for the system, selecting system components and predicting the expected performance of the system.

2.7.2 **Scheduling:** Determining the time when the various operations are to be performed. Availability of time, labor supply, job priorities, and crop requirements are some important factors.

2.7.3 **Operating:** Carrying out the operations with people and machines. The operator of an agricultural field machine tends to be self-supervised.

2.7.4 **Controlling:** Utilizing productivity measures and standards to control the system.

2.8 **Motion-and-time study:** Determining the time necessary to perform motions required for a particular job.

2.9 Operating width

2.9.1 **Effective:** The width over which the machine actually works. It may be more or less than the measured width of the machine.

2.9.2 **Theoretical:** The measured width of the working portion of a machine. For row crop machines, it is the average row width times the number of rows.

2.10 Operation

2.10.1 **Individual:** Operating one or more similar machines as one unit.

2.10.2 **Parallel:** Causing two or more similar machines to perform their respective functions simultaneously.

2.10.3 **Series:** Causing two or more machines to perform their respective functions in sequence; each machine operation, except the first, is dependent upon previous operations, and stopping one machine would halt all subsequent machines.

2.11 **Subsystem, crop production:** An ordered sequence of field machine operations performed in producing and harvesting a particular crop.

2.12 **System, crop production:** A combination of the various subsystems required for culture of all crops grown on a particular farm.

2.13 **System, machines:** An arrangement and use of two or more machines to achieve a desired output.

2.14 **Timeliness:** Ability to perform an activity at such a time that crop return is optimized considering quantity and quality of product (see ASAE Data D497, Agricultural Machinery Management Data).

2.15 **Timeliness coefficient:** A factor used to estimate the reduction in crop return (quantity and quality) due to lack of timeliness in performing an activity (see ASAE Data D497, Agricultural Machinery Management Data).

3 Terms associated with economics

3.1 **Cost accounting:** A system of accounting in which records of all cash and non-cash costs chargeable to any enterprise as well as all cash and non-cash returns are kept for the purpose of preparing an account to show costs of production, returns, and net profit or loss on the enterprise. Examples are labor, power, machinery use, building use, fuel, and interest charges.

3.2 Costs, machine

3.2.1 **Accumulated average cost:** Total cost for the accumulated use of a machine divided by the number of accumulated time units. Usually the time units are years or hours.

3.2.2 **Custom cost:** The amount paid for hiring equipment and operator services to perform a certain task. Custom costs normally include a charge for the operation of the basic machine, and may or may not include supplemental labor and equipment for such tasks as handling into storage or transport of a harvested crop, transportation of seed or fertilizer to the field, etc. Charges may be determined on the basis of area, time, transport distance or quantity of crop processed.

3.2.3 **Operating costs:** Costs which depend directly on the amount of machine use. Examples are labor, fuel, lubrication, and repair and maintenance costs.

3.2.4 **Ownership costs:** The costs which do not depend on the amount of machine use. Examples are depreciation, interest on investment, taxes, insurance, and storage.

3.2.5 **Total cost:** The sum of ownership and operating costs.

3.3 Depreciation

3.3.1 **Actual:** Change in value of a machine.

3.3.2 **Estimated:** The change in value as determined by the difference between purchase price and estimated future value, both in constant dollars.

3.3.3 **Straight line, declining balance, sum of years' digits:** Methods

to spread the change in machine value over the economic life of a machine. These methods may disagree with estimated depreciation.

3.4 Lease: A lease is a contract for the use of machinery for an agreed period of time in return for periodic payments. Ownership remains with the lessor. The lessee acquires the right of temporary possession and use.

3.5 Obsolescence: The process of becoming obsolete.

3.6 Obsolete: The condition of a machine when it is either out of production and parts to repair or update it are not available from normal suppliers, or it can be replaced by another machine or method that will produce greater profit.

3.7 Price: Market value per unit. Examples are the price of grain, usually dollars per unit measure; of labor, dollars per hour; of machines, dollars per machine.

3.8 Rent: A rental agreement is a short-term contract that permits use of machinery in exchange for a fee.

3.9 Return for sale of a service or product

3.9.1 Gross: The value received for a service or product before expenses are deducted.

3.9.2 Net: The value received for a service or product, less all expenses except income taxes.

4 Mechanical terms

4.1 Breakdown: An unexpected change in duty status from operational to non-operational, due to mechanical failure.

4.2 Continuous duty: A service requirement that demands operation for an indefinitely long period of time.

4.3 Conversion: Changing a machine from an arrangement suitable for the performance of one activity to one suitable for performance of another. An example is replacing a combine grain platform with a corn head.

4.4 Failure: The inability of a machine to perform its function under specified field and crop conditions.

4.5 Fuel consumption, specific: The fuel consumed by an engine to deliver a given amount of energy (kilograms of fuel per kilowatt-hour).

4.6 Maintenance and service: Periodic activities to prevent premature failure and to maintain good functional performance. Examples are refueling, changing oil and filters, cleaning, lubricating and adjusting components.

4.7 Major overhaul: Extensive rebuilding which extends the useful life of a machine, increases its value or adapts the machine for a different use.

4.8 Repair: Restoring a machine to operative condition after breakdown, excessive wear, or accidental damage. Repairs are less extensive than major overhauls and normally do not alter the value of the machine.

Cited Standard:

ASAE D497, Agricultural Machinery Management Data