

Research Paper :

Variable cost analysis of different agricultural tractors

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ABSTRACT

A study was conducted on the effect of power range and make of tractor on the maintenance, repair and fuel consumption of different make and power range of tractors. Tractors were classified into three power ranges *i.e.* 16-26 kW, 26-36 kW and 36-46 kW and in each power range four makes (M_1 , M_2 , M_3 and M_4) were selected for study. These tractors were mainly engaged for seed bed preparation and sowing. The basic data for maintenance and repair cost of tractors were collected from the University Farms, Crop Research Centre, Instructional Dairy Farm and the farms in the near by area of Govind Ballabh Pant University of Agricultural and Technology, Pantnagar, India. Field experiment was conducted to evaluate fuel and specific fuel consumption of various make and power range of tractors at Crop Research Centre, Pantnagar, during the year 2006-2007. Based on the variable cost and specific fuel consumption it was concluded that M_1 make tractors had least expenditure on repair and fuel cost during initial 4000 hours use.

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Agricultural mechanization implies the use of various power sources and improved farm tools and equipment, with a view to reduce drudgery of the human being and draught animals, enhance cropping intensity, precision, timeliness of operations, efficient utilization of crop inputs and to reduce losses at different stages of crop production. The end objective of farm mechanization is to enhance the overall productivity with increased economic returns. The agricultural tractor represents the central component of any mechanized farming system. The average power availability in India is 1.15 kW/ha where as the world average is more than 3.5 kW/ha and it needs to be increased to at least 2 kW/ha (Pandey and Mehta, 2007). Indian tractor industry is now the largest in the world with an average production of more than 2.5 lacs unit per year. However, in terms of total tractors used, the country ranks 8th in the world.

The country has tractor density of 10.5 tractors per thousand hectares of gross cropped area (GCA) compared to the international average of about 28 tractors per thousand hectares GCA (Pandey and Tewari, 2004).

Agricultural tractor production in India started in the year 1961. M/s Eicher Good Earth Ltd. is the first tractor manufacturer in India. The advent Green revolution in the late sixties helped manifold rise in the use of tractors on Indian farms. Presently, there are fourteen manufacturers of tractors producing various models in different power range. The current population of tractors is near the three million and every year about 2, 50,000 are being added to the fleet (Singh, 2006). The

effectiveness of the agricultural resources can be increased by using improved machinery and tractor efficiently.

Fuel consumption of tractor is major constituent of variable (operating) cost. Diesel fuel prices have been rising significantly over the past few years. In many areas, prices have risen by 40% or more which means higher operating cost for farm tractors. Improving fuel efficiency of tractor engines is a matter of national importance. Any saving in fuel consumption would reduce the drain of foreign exchange and therefore should receive utmost priority from all concerned. Reducing the specific fuel consumption by selecting appropriate make and model of tractor requires a specialized expertise and knowledge. To keep the tractor in working condition periodic maintenance and repairs are essential. Periodic maintenance is systematic series of inspections and operations performed periodically to maintain or improve the efficiency and performance of the tractor. Timely repair will also reduce the occurrence of breakdown and repair cost. Repair, maintenance and fuel consumption of different make and power range of tractors may not be similar and these may have significant effects on the variable (operating) cost.

METHODOLOGY

Selection of tractors was based on PTO power and make of the tractor. The data for maintenance and repair cost analysis of tractors were collected from the University Farms, Crop Research Centre, Instructional