

A computer simulation model of optimum sized tractor selection for agricultural mechanization.

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1985.

Abstract:

A computer simulation model for the selection of optimum-sized tractors based upon the durability and minimum cost analysis of the tractor has been developed. There is the need to optimize tractor sizes so as to minimize the cost and increase the productivity of farm mechanization process.

The optimal replacement period and reliability of the tractor are considered in this study with respect to the volume of utilization of such tractor. A procedure for determining tractor optimum size through the replacement period and reliability analysis is presented in the study.

The results of the study establish that two tractor models - David Brown 995 and 990 - of 62 and 58 horsepower respectively are recommended for the two categories of tractor owners and users involved in the study. DB 995 has been considered adequate for the private commercial farmers who cultivate between (30-40) hectares of land and DB 990 is recommended as the optimum machine for the government-owned tractor hiring units. The results of the work show further that a few policy implications may arise from changes in the two important quantities - maintenance and purchase costs of the tractor. A low maintenance and high purchase costs lead to extended replacement period and high durability. On the other hand, high maintenance and cheap purchase price of the tractor result in shortened replacement period and low durability for the tractor. The need to stop any subsidies on tractor purchase price and provide subsidised maintenance and repairs and also establish more government-owned tractor hiring units is Stressed in the study.

Keywords: Simulation/ agriculture/ model/ mechanization/ horsepower/ maintenance/ durability

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