

ON THE DESIGN AND DEVELOPMENT OF A LOW COST GARDEN TRACTOR

The introduction of tractors as mobile mechanical power sources has revolutionized Agriculture throughout the world. Although several makes of tractors are available in the country, the use of tractors in Agriculture in this State has been very scant. Samuel (1967) in a survey found that among others the high cost and heavy weight of these machines were two major deterrent factors in their wide spread adoption. It was found that even the cheapest power tiller cost more than Rs. 5000 and that the cost of transporting these machines from one place to another was even greater than their operating costs in many fields.

It was felt that intermediate technology could be of assistance and that a light weight low cost garden tractor if designed and developed could serve as a link between bullock power and the factory made power tillers and tractors. Such an attempt could also lend to evolving suitable designs for converting many of the engine driven pumpsets into garden tractors at small additional investments. This in turn should be a very attractive proposition to a great many farmers in this State who own portable pumpsets. Accordingly the following design requirements were laid out for the design of the new garden tractor.

1. The cost of machine should not exceed Rs. 1000 excluding engine.
2. The engine should be of light weight and within 3—6 hp range.
3. The weight of the whole machine should not exceed 100 kg.
4. It should have sufficient flotation and traction in wet soil.
5. It should be possible to fabricate the machine entirely in any local workshop excluding the engine.
6. Simple mechanisms should transmit power from the engine to ground drive components and other P. T. O. points.
7. The machine should have a power take off pulley for external equipment.

Details of engines used in popular makes of pumpsets were compared and a 3.5 hp "Villiers" air cooled engine of weight 35 lbs was selected to serve as the source of power for the tractor. Chasis designs of various power tillers were examined and that of the 'Briggs and Stratton' garden tractor was selected to serve as the basis for the design of the low cost tractor. The first prototype of the low cost light weight garden tractor to satisfy the design requirements was fabricated, (Figures 1 and 2) and a trial run taken successfully. A few alterations and additions on the machine are required before detailed tests can be conducted and the performance of the machine fully evaluated.

Reference

Jose Samuel, 1967. Equipment for Rice cultivation. *Vellayani Agricultural College Magazine*,

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