

TNAU TRACTOR MOUNTED THREE ROW PLUG TYPE VEGETABLE TRANSPLANTER



Design and developed by: TNAU, Coimbatore Centre



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Introduction

In Tamilnadu chilli and brinjal are cultivated in 86315 and 10420 ha, respectively. Transplanted crops mature in shorter duration and requirement of labour is reduced. There is tremendous scope to mechanize transplanting operation by applying inputs judiciously. Presently nursery preparation including soil preparation, seeding maintenance and transplanting operations is performed manually. The advantages of mechanized nursery and transplanting are control of the plant growth during propagation and the survival and growth of the plants after transplanting.

Evolution and design process

The need of precision transplanting equipment for vegetables seedlings was felt in Tamil Nadu for saving of labour, costly hybrid seeds of vegetables. For all the three crops (chilli, tomato, brinjal) media mix was optimised with coconut pith and vermin-compost in 1:1 ratio. The nursery raising system was also optimised with portable seedling tray with 98 cells. The components of the system were media bin, bucket elevator, media sieve, screw conveyor, media mixer and tray conveyor. The capacity of nursery raising system was 750 trays/h. The three row (plug type) vegetable transplanter was designed and tested

Salient features

Tractor mounted plug type vegetable transplanter consisted of main frame with hitching system, ground wheel, shoe type furrow openers, compaction wheel, operator's seats, two depth control wheels and plug type metering mechanism. It employed press wheels inclined at an angle of 15° with the vertical as soil covering device. The plant spacing can be adjusted. Power is transmitted from ground wheel to gear box through chain and sprockets and from gear box to discs by belt and pulley.



Plug type veg. transplanter in operation

The auxiliary frames provided to mount furrow openers, furrow closures, operator's seat and two depth control wheels.

Performance result

The impact of the seedling with soil block helps in its placement. For chilli, brinjal and tomato the machine was tested at forward speed of 1.4 km/h. The average field capacity of transplanter was 0.14 ha/h. Average field efficiency of machine was 75% for chilli, tomato and brinjal with 450 mm row spacing. The working width of machine was 1350 mm (Table-1).

Table 1 Performance results of Tractor mounted Plug type transplanter

Parameter	Values
Soil moisture content (d.b), %	12-13
Working width, mm	1350
Row spacing, mm	450
Speed of operation, km/h	1.4
Field capacity, ha/h	0.14
Field efficiency, %	75
Draft, kg	250

Status of Technology

The prototype of vegetable transplanter costing about Rs 35,000/- has been designed and developed to suit the requirement of vegetable growers. The machine has been tested under laboratory and field conditions. Further field trials at farmer's fields and KVK's have been proposed in the current season.

Specifications of Plug type vegetable transplanter

Type	Semi-automatic
Overall dimensions (L x B x H), mm	1800 x 1600 x 1400
Weight, kg	350
Number of rows	3
Suitability for crops	Chilli, brinjal, tomato
Main frame size (LxBxH), mm	1100 x 850 x 80
Auxillary frame (LxBxH), mm	1200 x 750 x 40
Diameter of ground wheel, mm	750
Discs in transplanting mechanism: Number	3
Size, mm	460
Cost, Rs.	35000
Power requirement, kW	33.57 kW tractor or above

Available from

The Principal Investigator
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