Performance Evaluation of Tractor Drawn Turmeric Planter

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Abstract: ***Tractor drawn turmeric planter developed by Dattkrupa Agro engineering work, Satara. Krishi Vigyan Kendra Sagroli, District Nanded Maharashtra was tested and demonstrated for sowing turmeric rhizomes on farmers' field during 2019-20. Its performance evaluation was carried out with conventional sowing by manual. Field tests showed that turmeric planter performed well for sowing turmeric rhizomes in the Duatapur village. The field capacity of the planter was 0.6-0.8 ha/day. The planter saved 6-15% rhizomes, 25-43% labour and increased crop yield by 9-16% as compared to conventional manual sowing.***

Keywords: turmeric planter, performance evaluation.

INTRODUCTION

Agriculture plays an important role in the life of economy. It is the backbone of our economy system. Turmeric is an important spice crop cultivated in Maharashtra. India accounts for about 80% of world turmeric production and 60% of world exports. The root of turmeric is also widely used for medicinal purposes. During manual planting, the labors have to dig the soil to sow turmeric. The manual method of seed planting, results in low seed placement, serious back ache, need for huge labor source, high labor cost and drudgery in their work. This results in inadequate and non-uniform plant stand. This practice not only results in higher planting material cost but also lower the crop yield. Apart from this, conventional system requires skilled labour. The traditional system has the limitations of uneven depth of rhizomes placement, slow ground coverage and high labour requirement. The availability of easy to use Tractor drawn turmeric planter for farmers can alleviate these problems substantially, and can also help to maintain timely planting and reduce the farmers' drudgery. The present study was hence, planned to evaluate tractor drawn turmeric planter.

MATERIAL AND METHODS:

The different planting methods of turmeric were conducted at farmers' fields at Duatapur village Block Biloli district Nanded and Krishi Vigyan Kendra, Sagroli during 2019-20 which are described below:

Table A: Different method of plantation

Method of plantation	No of trails	Area, Acre	Seed rate (q/acre)
T1: farmers practice (manual planting)	10	10	8.5
T2: Use of Tractor drawn turmeric planter	10	10	6.8

Tractor drawn turmeric planter consists of following parts viz. Feeder, metering mechanism, chain drive, bevel gears, rotating steel small bowl, fertilizer tank, seed box, furrow openers, seats and a ground wheel for transmitting the power to the shaft. Fig A shows the Plantation of turmeric with the Tractor drawn turmeric planter.

Fig 1: Tractor drawn turmeric planter

In Tractor drawn turmeric planter, two persons sitting on the machine filled the rotating steel small bowl with turmeric rhizomes manually. The machine is mounted on a 3-point linkage of a tractor. The specifications of Tractor drawn turmeric planter are given in Table B.

Table B: Specification of tractor drawn turmeric planter

Particular	**Specifications**
Overall dimensions, cm	182 *167 *190
Drive to working parts	From ground wheel
Ridge forming device	Ridgers
Seed hopper capacity, kg	85
Type of furrow opener	Shovels
Row to row spacing, cm	45
Number of rows	2
Working width, cm	90

Ten trails were conducted under On Farm Testing (OFT) at Duatapur village Block Biloli District Nanded. One acre area of each farmer was sown this tractor drawn turmeric planter. The well rotten farm yard manure @ 10-12 tonne per acre had been applied before planting because turmeric respond favorably to farm yard manure. Light and frequent irrigations were applied. In order to check weeds, one or two hoeings had been given. Harvesting was done manually.

RESULTS AND DISCUSSION

The details of field performance of Tractor drawn turmeric planter are shown in Table 2. The machine worked satisfactorily and covered about 0.68-0.83 ha/day. The damage to turmeric rhizomes was negligible. The turmeric rhizome missing was about one per cent.

Table 2: Machine performance in the field for turmeric plantation

Particular	**Specifications**
Effective field capacity, ha/day	0.68-0.83
Rhizome missing, %	1-2
Rhizome damage, %	Negligible
Power requirement , hp	35-50
Labour requirement (No's)	3
Rhizome to rhizome spacing, cm	20
Depth of planting, cm	7
Optimum speed of operation, km/h	1.0-1.5

Comparison of tractor drawn turmeric planter to traditional method is shown in table 3.In traditional method average cost of operation is Rs.8800 per ha and in tractor drawn turmeric planter average cost of operation is Rs. 4980 per ha. Due to use of tractor drawn turmeric planter cost of operation saving up to 43%. In traditional method average yield of turmeric rhizome is 110 quintal per ha and in tractor drawn turmeric planter average yield of turmeric rhizome was 124 quintal per ha. Tractor drawn turmeric planter put rhizome at suitable depth and spacing. It increased crop yield by 9-16% as compared to conventional manual sowing.

Table 3: Comparison of tractor drawn turmeric planter to traditional method

Parameters	***Traditional method***			***Tractor drawn turmeric planter***			***Change in parameter,%***
	Highest	***Lowest***	***Average***	***Highest***	***Lowest***	***Average***	
Cost of operation, Rs/ha	10200	8000	8800	5600	4500	4980	43
turmeric rhizome Yield, Q/ha	115	104	110	130	120	124	12

Labour requirement for plantation of turmeric rhizome 40 to 50 % saving as comparison to traditional method. Cost of operation is saving 20 to 28 % as comparison to traditional method.

Fig 2: Turmeric crop stand planted by tractor drawn planter

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