

## Design, develop and testing of six –row manually operated virendra paddy drum seeder in partially reclaimed soil of district Unnao, Uttar Pradesh

■ BALJEET BAHADUR VERMA

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Correspondence Author for

**BALJEET BAHADUR  
VERMA**

Krishi Vigyan Kendra, Dhaura,  
Hasanganj, UNNAO (U.P.) INDIA

■ **ABSTRACT** : A six row paddy drum seeder was designed developed and tested at the farm of Krishivigyan Kendra, Dhaura, Hasanganj, unnao and at farmer's field under on farm trials (OFT) during the year 2009-2010 and 2010-2011. The aims of designing this machine were to solve the shortage of labour during peak period of transplanting and the proliferation of farm mechanization in partially reclaimed soil. During testing, three trials T<sub>1</sub>(Transplanting of 25 days nursery in puddle field)T<sub>2</sub>(Broadcasting of germinated paddy in puddle field)and T<sub>3</sub> (Line sowing of germinated paddy by paddy drum seeder in puddle field) were conducted. The machine was operated by single man in puddle field with 1-2cm of standing water for making line clearly. During trial the machine was found to be easy in operation and sharp turning. After testing the machine was found to be success in solving labour shortage during peak period of transplanting. It saved 62 per cent and 61 per cent labour in comparison to transplanting and broadcasting respectively. The net income of line sowing was found to be 16.04 per cent and 19.22 per cent more in comparison to transplanting and broadcasting methods, respectively. The cost of cultivation of line sowing was found to be 32.12 per cent and 33.44 per cent less in comparison to transplanting and broadcasting methods, respectively. Thus, in all respect this technology was found to be best.

■ **KEY WORDS** : Virendra paddy drum seeder, Reclaimed soil

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**D**istrict Unnao comes under waterlogged areas. Due to late transplanting the excess rain water damaged lot of crops every year. Due to late transplanting, crop ripens later and also affect the timely sowing of the wheat crop. Due to late sowing of wheat not only reduction in production but also the farmers become unable to take third crop (*Zaid* crop).

Human power is an important source for operating small implements and tools. An average man can develop maximum power of about 75 watts which is equivalent to about 0.1 horse power. Its availability is easy but costliest power compared to all other forms of power. Now days the Mahatma Gandhi National Rural Employment Guaranteed (MNREGA) scheme make the labour scarcity and costliest source of power in agriculture. Seeing the problem of labour scarcity, one has to adopt the paddy drum seeder for timely completion of the paddy crop sowing. A six row paddy drum seeder has been developed by krishi Vigyan Kendra, Dhaura, Hasanganj, Unnao, Uttar Pradesh for the purpose of solving labour problem among farmers (Fig.A and B).

This machine was designed with material easy availability in local markets near Krishi Vigyan Kendra named Mohan.

There are many advantages in use of seeders. Reduce the application of chemical herbicides by protecting environment and increased yield from 10-15 per cent are some of the benefits of seeder weeder combination (Bhandara)

The labour scarcity for transplanting led to use of drum seeders for direct sown paddy in Trichy district. The farmers shown greater interest in adopting direct paddy seeding technology due to shortage of labours during peak season. The 8 row paddy seeder developed by TNAU was demonstrated in E. vellanur of Lalguditaluk for direct sowing paddy in 25 acres in *Kharif* season of 2006-07. Based upon their experiences, the farmers have themselves fabricated 5 numbers of paddy drum seeder replica of TNAU model in local workshop for their own use.

Seeing all above advantages idea came in mind to design, develop a six row paddy drum seeder for direct seeding of germinated paddy.

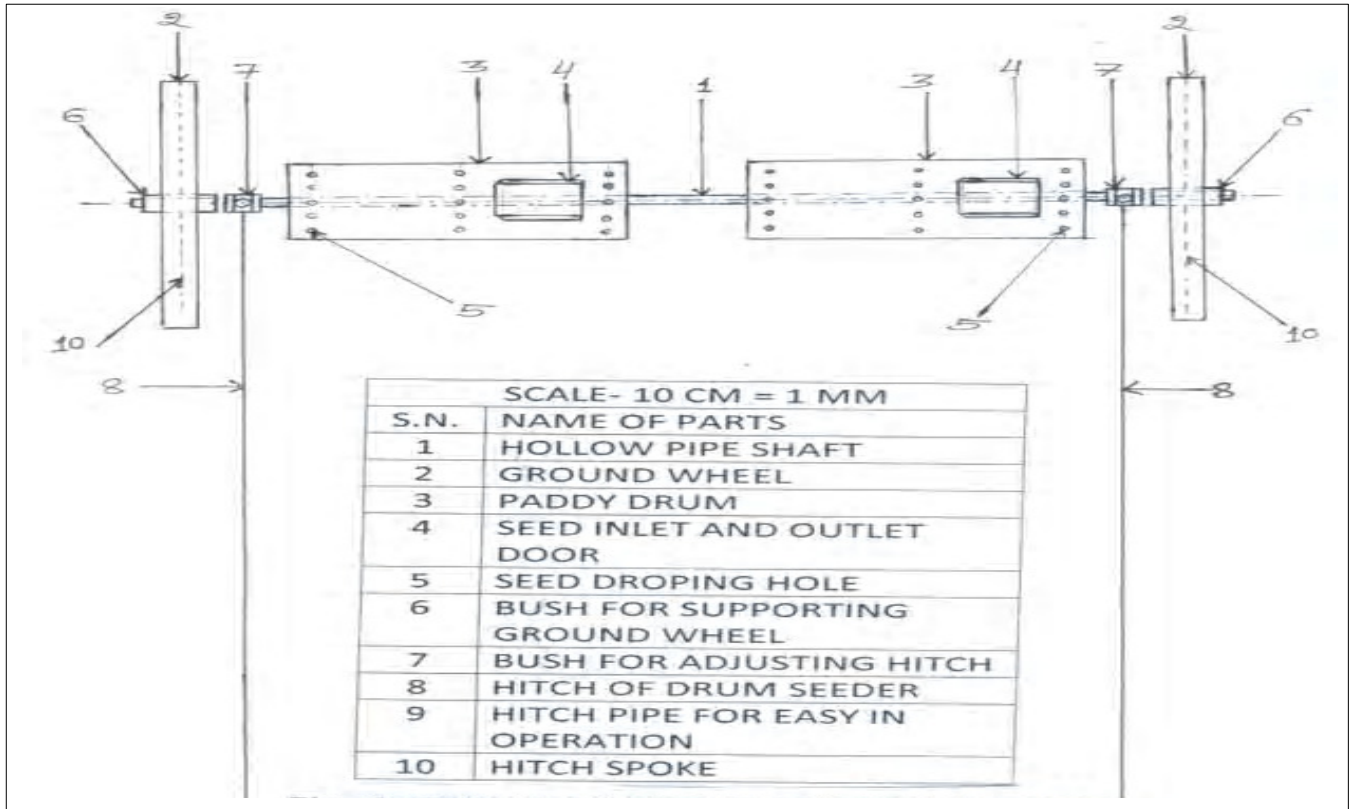


Fig. A: Top view of paddy drum seeder

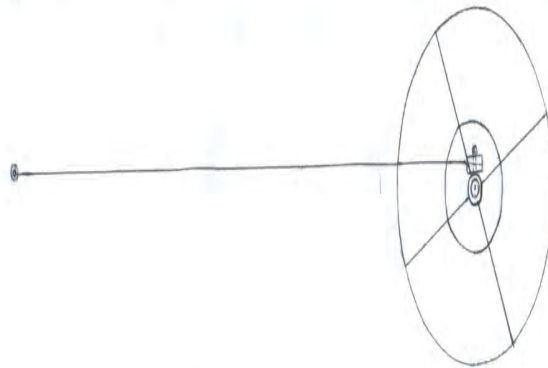


Fig. B: Front view of paddy drum seeder



Fig. C: Training and demonstration of six row paddy drum seeder

Sr. No.	Name of treatment	Description of treatment
1.	T <sub>1</sub>	Broadcasting of germinated seeds in puddled field
2.	T <sub>2</sub>	Transplanting of paddy in puddled field
3.	T <sub>3</sub>	Line sowing of germinated paddy seed in puddled field

Sr. No.	Particulars	Paddy Drum Seeder
1.	Overall dimension (L x W x H) mm	1850 X 143 0X 650
2.	Weight in kg	10.5
3.	Cost in Rs.	2000.00
4.	Number of rows	6
5.	Row spacing in mm	20
6.	Diameter of hole in mm	15
7.	Drum of seeder	
I	Material of drum	Mild steel sheet
ii	Number of drum	2
iii	Drum diameter in mm	270
Iv	Length of drum, mm	440
8.	Shaft of paddy drum seeder	
I	Shaft material	Hollow cast iron pipe
ii	Shaft length in mm	1430
iii	Shaft diameter in mm	25
9.	Ground wheel	
I	Material of ground wheel	Rim of bicycle
ii	Number of ground wheel	2
iii	Ground wheel diameter in mm	650
Iv	Number of spokes	4
V	Material of spokes	10, mm dia of iron rod
10.	Hitch of the paddy drum seeder (L x W ) mm	1850 X 1100
	Hitch material	10, mm dia of iron rod
11.	Man power	1 number
12.	Field capacity, ha/day	1.25

### Benefits :

- Light in weight
- Easy to transport and handle
- Uniformity in sprouted seed sowing
- Seed saving is achieved with the equipment as compared to traditional method
- Line sowing is done with the equipment that promotes use of mechanical weeders thereby reducing drudgery and cost during weeding operation.
- Easy management of labour shortage in present situation because labour is costliest among all agricultural inputs.
- Save time and money in nursery rearing as compared to transplanted paddy.

### ■ METHODOLOGY

A six row paddy drum seeder has been developed by KrishiVigyan Kendra, Dhaura, Hasanganj, Unnao, and Uttar

Pradesh for solving the labour problem among farmers during the year 2009-2010. This machine was designed with material easy availability in local markets near KrishiVigyan Kendra named Mohan. A paddy drum seeder on the basis of literature available was designed, developed and tested at krishiVigyan Kendra and also at farmer's field during the year 2009-2010 and 2010-2011. The detail specification of the paddy drum seeder is given in Table B. During experiment the three treatments T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> were conducted, the details of the treatment are given in Table A.

The detailed specifications of the paddy drum seeder are given in Table B.

### ■ RESULTS AND DISCUSSION

The result obtained is given in the in Table 1.

The machine developed was found easy in operation due to very light in weight. One labour is required to operate

**Table 1: Data's related to experiment conducted**

Sr.No.	Particulars	T <sub>1</sub> (Transplanting)	T <sub>2</sub> (Broadcasting)	T <sub>3</sub> (Line sowing)
1.	Cost of nursery Rs./ha	1700	-	-
2.	Seed rate kg/ha	60	40	25
3.	Labour in required transplanting/sowing Nos./ha	10	1	1
4.	Weeding Nos./ha	60	80	30
5.	Labour required in harvesting and beating Nos./ha	50	50	50
6.	Cost of cultivation Rs./ha	23980	24220	18150
7.	Production qt/ha	62.56	61.28	63.45
8.	Gross Income Rs./ha	62560	61280	63450
9.	Net Income Rs./ha	38520	37060	45880

this machine in field. For making clear line the standing water in the field was kept 1-2 cm. There was sharp turning in field at the same point because the one wheel of the machine was fixed at the shaft and other one was free to rotate.

Due to being labour shortage during the peak period of transplanting this technology was selected. On the basis of the result of the experiment conducted, this technology was found suitable in saving cost of cultivation, time saving and increasing production. In the cultivation of paddy crop by transplanting, broadcasting and line sowing labour required was 131,120 and 81 respectively. The weeds in case of broadcasting and line sowing was more in comparison to transplanting because in transplanting crop there was standing crop for longer time due to rain. This is the reason of fewer weeds in transplanting crop in comparison to broadcasting and line sowing. The cost of cultivation was found to be Rs.23980, Rs. 24220 and Rs.18150, respectively in case of transplanting, broadcasting and line sowing methods. The net income was found to be Rs.38520, Rs. 37060 and Rs.45880, respectively in case of transplanting, broadcasting and line sowing methods. The more income in case of line sowing was due to labour saving in sowing and weeding operation. The income of transplanting was more in comparison to broadcasting due to more production and less weeds.

#### Conclusion :

After testing the machine was found to be successful in solving labour shortage during peak period of transplanting.

It saved 62 per cent and 61 per cent labour in comparison to transplanting and broadcasting, respectively. The net income of line sowing was found to be 16.04 per cent and 19.22 per cent more in comparison to transplanting and broadcasting methods, respectively. The cost of cultivation of line sowing was found to be 32.12 per cent and 33.44 per cent less in comparison to transplanting and broadcasting methods, respectively. Thus in all respect this technology was found to be the best.

#### ■ REFERENCES

- Bhandara, M.H.M.A.** Chief Department of Agriculture Sri Lanka. Country Report-Sri Lanka.
- Reddy, P., Bala, Hussain, Srinivasan, S. and Manohar, C. (2007).** Direct Seeding with Drum Seeder-Future Prospects.
- Sahay, Jagdishwar (2004).** Elements of Agricultural Engineering fourth edition. Low land paddy seeder pp-290-91. Presented at the 28th International Rice Research Conference, 8-12 November 2010, Hanoi, Vietnam pp 02: Closing the Yield Gap under the topic meshing mechanization with SRI methods for rice cultivation in NEPAL.
- Singh, S.P., L.P. Gite, Agrawal, Nidhi and Majumdar, J.** Women Friendly Improved Farm Tools and Equipment. 2007 pp-18-19.
- Success stories (2006-07) Krishi Vigyan Kendra, Triuchirappalli District. Direct sown paddy through Drum seeder.

#### ■ WEBLIOGRAPHY

- The Hindu, <http://www.thehindu.com/2009/08/31/31/stories/2009083152460300.htm>. Drum seeder method gives good yield.

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