AgriCos e-Newsletter
ISSN: 2582-7049
Volume : 01 Issue : 05 September 2020 Article No: 30

Power Tiller: A Boon for Marginal and Small Land Holding Farmers in India

Fartade A. C. and Kanade S. A.
M.Tech (Agricultural Engineering), Department of Farm Machinery and Power, BCKV, Mohanpur (WB)

SUMMARY

This article contains an overall review on importance of power tiller for the marginal and small land holding farmers in India. The level of farm mechanization in India can be increase to enhance farm productivity by means of introducing power sources like tractor, power tiller, electrical motors etc. In India, marginal and small land holding by farmers are about 68.45 and 17.62 percent respectively. They are adopting and utilizing selected farm equipment for efficient farm management through custom hiring. It possesses difficulty to afford custom hiring or great power sources like tractor. Power tiller can be alternate solution to tractor for different attachments for farming operations and can affordable by marginal and small land holding farmers.

INTRODUCTION

Power tiller is a prime mover in which direction of travel and its control for field operation is performed by the operator walking behind it. It is also known as hand or walking type tractor (BIS, 2002). Power tiller is walking tractor mostly used for rotary cultivation in puddle soil and can be replace the animal power more effectively and help in increasing demand for human labour. Power tillers have been used in Indian agribusiness since the 1980s, Power tillers can deal with small as well as large farms, but they are particularly suggested for farms where the land size is small. Paddy growing farmers with small and marginal land use power tillers effectively in water-flooded fields, for puddling operation. In addition to tilling the soil, Power tillers can also be used for ploughing the soil, sowing seeds, planting seedlings, harvesting crops, threshing crops and transporting crops with different attachments. Power tillers till only to the destined depth, smoothening and loosening the soil, and making it simpler to paddy transplanting in the water submerged field.

Benefits of Power Tiller to Farmers

- Power tillers are more affordable than tractors, and the Indian government gives subsidies to the farmers to buy them.
- It requires less space for storage.
- It consumes lower fuel than tractors.
- It can be efficiently used in different types of lands like flatlands, hilly terraces, water submerged fields, and dry fields.
- It is more useful in regions where there is shortage of labour.

What is Farm Mechanization?

Farm mechanization is the process of improving farm labour productivity through the use of agricultural machinery, implements and tools. Mechanization is a key input in any system. The productivity of farms depends greatly on the availability and judicious use of farm power by the farmers. Agricultural machines increase productivity of land and farmers by meeting timeliness of farm operations and increase work output per unit time. Over the last years, there has been considerable progress in agricultural mechanization. Yet the fact remains that marginal and small land holders are adopting and utilizing selected farm equipment for efficient farm management through custom hiring.

Status of Land Holdings in India (Source: Agriculture Census Phase-I, 2015-16.)

Category	Size of land holding, ha	Percentage of total holdings
Marginal	<1	68.45
Small	1-2	17.62
Semi-medium	2-4	9.55
Medium	4-10	3.80
Large	>10	0.57

Farm Power Availability (FPA) in India

The average farm power availability of India is about **2.025 kW/ha** (Final report of Mechanization and Technology division by Ministry of Agriculture and Farmers Welfare, 2018). To enhance the cropping intensity and output of the farm sector, this level needs to be raised to 2.25 and 3.97 kW/ha by 2022 and 2030, respectively by introducing power sources like, power tiller, tractors, electric motors, and engines. Although majority of land holdings are small and fragmented, use of manual power for some of the farm operations needs to be reduced to enhance timeliness and also to reduce drudgery.

Some important Attachments of Power Tiller for Agricultural Operation

Rotary Blades

- Mostly used in sugarcane and banana for loosen the hard soil surface and intercultural operations like deweeding, bund formation etc.
- Used to pulverise stubbled soil after harvesting.
- Field coverage: 1.5 to 2 acres/day.
- Average fuel consumption: 1.5 to 2 litres per hour.

Cage Wheel

- Used for puddling of field before paddy transplanting.
- Helps to improve traction performance.
- Eliminate the load on tiller.

Cultivator

- Used as a secondary tillage implement in a dry land for seed bed preparation.
- Field coverage: 2.5 to 3 acres/day
- Average fuel consumption: 1.25 to 1.5 litres per hour.
- Width of cut: 600 mm
- Depth of cut: 100 to 150 mm.

Mould board Plough

- Used as a primary tillage implement to cut hard soil surface.
- Suiable for plouging virgin land which is not disturbed from long period.
- Field coverage: 1 to 1.25 acres/day
- Average fuel consumption: 1.5 to 2 litres per hour.
- Depth of cut: 200 to 250 mm
- Width of cut: 300 mm

Seed cum Fertilizer Drill

- Used for sowing seeds with attachment of fertilizer box.
- Fertilizer spreads in a rows just after sowing of seeds.
- Field coverage: 1.25 to 1.75 acres/day.
- Average fuel consumption: 1.25 to litres per hour.
- Working width 660 to 900 mm .

Ridger

- Used to make ridges for row crops such as potato, chillies, sugarcane, banana etc.
- Should be used in a loose and moist soil after primary tillage operations.
- Field coverage: 1 to 1.25 acres/day
- Average fuel consumption: 1.5 to 2 litres per hour.
- Depth of ridge: 250 to 300 mm
- Width of ridge: 370 to 450 mm.

Power tiller Mounted Trailer

- Used to transport agricultural and other goods.
- Average capacity of transport is about 1.5 tonnes.
- Average fuel consumption during transport: 1.0 to 1.25 litres per hour.
- Water tank of about 1000 litres can also be fitted.

CONCLUSION

Power tiller is a very benefecial and affordable power source for different agricultural operations. Power tiller is capable for primary and secondary tillage operations with the different attachments like plough, cultivator, cage wheels, seed cum fertilizer drill, ridger etc. The weight of power tiller is less as compare to tractor, which is a favourable factor for working in dry land and wet land. In India most of farmers are marginal and small land holdings, so it is very affordable and benefecial to introducing power tiller to them. The level of farm mechanisation and farm power availability per hectares also increases with the help of power tiller. Overall, power tiller can be used as a multi-purpose machine and is a boon for marginal and small land holding farmers of India.

REFERENCES

Agriculture Census, 2015-16, Phase- I, (2019). All India report on number and area of operational holdings. *Ministry of Agriculture & Farmers Welfare, Government of India*.

Bureau of Indian standards (BIS), (2002). IS-9935. Power tiller test code. *Indian Standards Institutions, New Delhi, India*.

Kumar S. and Kumar P. (2018). Different attachments of power tiller: A review. *International Journal of Science, Environment and Technology*, 7(3):1024-1035.

WAPCOS Limited, (2018). Final report on monitoring, concurrent evaluation and impact assessment of submission on agricultural mechanization. *Ministry of Agriculture and Farmers Welfare, Government of India.*