

Performance and seed pattern characteristics of alow cost manually operated cup feed metering seed drill for sowing the paddy seeds

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■ **Abstract** : A low cost and manually operated multi crop seed drill with suitable dimensions of cup in cup feed metering mechanism for a particular crop has been developed and evaluated in the field condition to study its seed pattern characteristics and economic viability for small and marginal farmers in the state of Odisha. The seed drill developed was evaluated with the prevailing paddy variety 'Pathara' in the Central farm OUAT, Bhubaneswar in the year 2008 with the objectives of optimizing the dimensions of cup for paddy sowing, studying the seed pattern characteristics like seed rate deviation, seed distribution and seed damage, performance evaluation and finally its economics of use. From the experiments it was found that the dimension of the cup *i.e.* 10 mm x 9.48 mm was found to be best and was used successfully up to a peripheral speed of 23.56 m/min with the desired seed rate deviation, seed distribution and seed damage for sowing of paddy. The actual field capacity of the seed drill was 0.074 ha / h with a field efficiency of 77.08 per cent and there was a net savings of Rs. 1813.00 per hectare for paddy in comparison to the local traditional practice. This seed drill costing of Rs. 1850 and total operating cost of Rs. 13.85 per hour may solve the problem of line sowing of seeds particularly for the small and marginal farmers of Odisha to enhance production and productivity as a whole.

■ **Key words** : Farm mechanization, Seed drill, Cup feed metering mechanism, Paddy sowing

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The seed metering mechanism is the most vital component of the seed drill. The performance of a seed drill is mainly dependent on the type of metering device. In addition to this, the type of soil and field condition, preparation of seed bed, speed of operation and power source also affect the performance of the seed drill (Kepner *et al.*, 2000). The crop yield as well is affected by plant population, row spacing, plant to plant spacing, type and variety of seed and their emergence (Ojha and Micheal, 1978).

The fluted roller feed type metering device is very popular in India. This type of metering device is very much suitable for grain crops and not for bold seeds. Moreover, there is a concern for this type of metering device when the seed damage exceeds three per cent (Goel and Verma, 2000). Another metering device used was of cell feed type for manually operated seed drill. In this type of metering device, controlling of the seed rate was difficult. It was reported that the slightest displacement of brush contact varied the seed rate to a great extent under the field condition. In recent past, cups having

semi circular type have been introduced for seed metering device in manufacturing of seed drill (Sahoo and Srivastava, 2000). Due to vibration and shock, the seed retention and release for these cups were poor. So the cups were modified to cylindrical at top and conical at the bottom for better retention of seeds.

The socio-economic conditions of the farmers in the state Odisha (Anonymous, 2005) do not permit them to have different seed drills for different crops. They are, therefore, bound to follow the traditional practice and face difficulty in intercultural operations and overall management of their crop. As the yield rate is low, farmers derive marginal benefit out of these crops. However, the seed drills having cup feed metering mechanism can be suitably utilized for various crops only by changing the cups and with minor modifications (Garg and Dixit, 2003). Hence, the seed drill having cup type metering mechanism can be suitably used as a multi crop seeder for the crops like paddy, groundnut, green gram and black gram. So, studies on cup feed metering mechanism will help in developing a multi crop seeder