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Research Paper :

Performance evaluation of bullock drawn multi crop inclined plate planter

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ABSTRACT

Three - row bullock drawn multi-crop inclined plate planter was developed at C.I.A.E Bhopal for sowing different type of crops. The calibration for the seed and fertilizer rate was done in the laboratory of C.A.E. R.A.U. Pusa Samastipur. The seed rate was found 20.60 kg/ha for the maize crop and fertilizer rate was found from 9.3 kg/ha to 124.3 kg/ha. The wheel skid was in tolerable limit as it was recorded 4.53 %. The field capacity was 0.23 ha/hr and field efficiency was 51.1 %. The plant population was found 10 – 12 plants per square meter. The cost of sowing per hacter was 3.5 times economical than traditional method.

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Key words : Bullock drawn, Inclined plate planter, Field capacity, Field efficiency

Improvement of socio-economic condition and growth of the country depend on the development of agriculture. The effective demand of food grain is expected to be around 265.8 million tons by 2020 AD against the production level of 223 million tons. So our country is in great need of increase in food grain production.

Maize is one of the important cereal crops. The average production of maize in India is 8.66 million tons, but at present demand is 10.28 million tons. Expected demand in 2015 and 2030 would be 11.71 and 12.87 million tons, respectively (Source - Economic Survey).

Sowing is one of the important agricultural operations for raising crops. Proper application of fertilizer at proper location has also a good effect on crop growth and yield and seed rate, proper placement of seed fertilizer and row spacing are also necessary. The main reason for increase in yield is the uniform and controlled application of fertilizer with respect to seed in a concentrated bond at about 50 mm below and 50 mm away from the seed.

Traditional method of sowing is not suitable for growing the crop. The result is very low production. There are many faults such as not proper seed rate, fertilizer rate so several type of planter has been developed by various research organization and agricultural engineering institutions. Bullock drawn inclined plate planter has been developed by C.LA.E. Bophal. The use of bullock drawn inclined plate planter to increase the grain yield is very necessary because of the farmers of India are very poor. They are not able to purchase the tractor and power tiller.

The most important source of power in the farm all over the third world and especially in India is animal. Animals are the largest contributor of farm power in India and yet, the major source of marginal, small and even medium farmers who account for more than 80% of total agricultural holding and 40% of total cultivated

The machine combines there function is seed drill or planter. The basic difference between seed drill and planter is that a seed drill sows seeds at specified rate and at the proper depth and in rows. It cannot deposit the seeds in hills nor in check rows, where as a planter can deposit seeds at a specified rate in hills and rows spaced to permit inter row cultivation and also function as a seed drill if required, several studies have shown that the use of planter increase the yield by 15 to 25% and may increase up to 40% depending upon the crop variety. Increase in yield is due to uniform and controlled drilling of fertilizer with respect to seed in a concentrated band. Fertilizer is placed about 5 cm below and 5 cm away from the seed which provides good environment for root development. As soon as germination takes place, root branches go down at about 45^0 angle in soil and come into direct contact of fertilizer within a few days after germination.

History and Background:

Seeding by hand was practiced universally untill the middle of last century. The history of grain drill is a part