Design and development of a manually operated low cost seeder for small seeds

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Cereals with small seeds such as Gingelly, Kurakkan, Meneri and Thanahal can be used as human and livestock feeds. Increased minor food production can play a vital role in alleviating food shortage in Sri Lanka. For increasing production of these food crops not only high quality seeds and effective cultural practices, but more appropriate technique and tools are also very important. There is a good scope for increasing yield per hectare of these food as well as total area sown by introducing the advance technology including mechanization. To enhance the increased production of Gingelly, Kurakkan, Meneri and Thanahal , the planting techniques is the major constraints.

A manually operated seeder was designed and developed for small seed crops such as Kurakkan Gingerly, Meneri and Thanahal after testing first proto-type seeder and implementing necessary modifications. The developed seeder has frame, wheel, metering mechanism, hopper, seed tube, handle and marker.

Laboratory and field experiments were conducted to evaluate the performance of above designed seeder. A comparative performance of the new raw seeding technique introduced by designed seeder was compared with traditional hand broadcasting method.

Weight of 1000g, Hardness, Moisture content, Germination and Bulk density of the seeds were inspected in the Laboratory. Delivery rate, Rate of damage seed caused by metering mechanism, Pattern of seed deposited, Field experiment, Working capacity, Delivery rate in the field, Travel reduction (slippage), Depth of seeding, and Ratio of established plants to seeds planted were considered as criteria for the evaluation of designed Seeder.

The delivery rate observed in the laboratory for Gingelly Kurakkan and Menery were 5.8 kg/ha, 5.9 kg/ha and 7.2 kg/ha respectively. In the case of field experiment these values were slightly lowed due to minus travel reduction. The damage seed percentage of the designed machine for Gingelly, Kurakkan, Menery and Thanahal were 9.7, 7.5 and 3.4, 2.8 respectively.

Average travel reduction of the machine is -4.8%. The effective working capacity of the seeder is 0.66 ha/day, which was significantly higher to that for broadcasting. It shows that the broadcasting is 5 times costlier than machine seeding. On the basis of above results, the design Seeder can be recommended as better planting equipment which is successfully used in row seeding of small seed crops.

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