

DEVELOPMENT OF CENTRIFUGAL ASPIRATOR OF PNEUMATIC METERING MECHANISM PLANTER OF RAINFED SEEDS

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Abstract: A pneumatic metering mechanism for planting of different seed was developed for precise planting for groundnut, cotton, okra, sesameseeds. Centrifugal aspirator with radial blade was designed for creating the required vacuum pressure that pressure is required to pick the single seed. The optimum vacuum pressure was found to be 5, 2, 2 and 0.3 kPa for groundnut, cotton, okra, and sunflower. The airflow velocity 3.3 m/s gave the best results, with minimum lateral displacement of the seed. Effect of the different shapes of the seed plate orifice, upon the pneumatic planting of different shaped was analyzed which showed that the proper orifice shape was circular for spherical seed and elliptical for longer and flatter seed. The dimension of the seed plate orifice was 3mm diameter circular plate for okra seed, where as for groundnut, cotton and sesame seed, the elliptical shaped orifice with dimension (5,4.5), (3,3.5), (2.24,0.80) mm longer and shorter axis gave best result. The sizes of the different shaped orifices were analyzed to the effect of seed box exposed area upon the seed picked per orifices. The result for all shaped orifices clearly indicated that the meeting rate increases with the increase in the seed exposed area.

Keywords: Pneumatic metering mechanism, Orifice plate, Centrifugal aspirator, Vacuum pressure

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