CONTROL OF SEED METERING IN SOWING MACHINES

By

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التحكم في تلقيم البذور في آلات الزراعة

رسالة مقدمة من

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ABSTRACT

Adel Khazal Daboul: Control of Seed Metering in Sowing Machines. Unpublished Ph.D Thesis, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2012.

Construction and performance of seed mechanism for seed metering device, is based on the vibration for metering seeds has been done. It is adapted to minimize the seed damage and optimize seed rate and distribution.

An eccentric - weight motor was used as a source of vibration for the metering device. This device was tested on a soil bin. Seven vibration frequencies were used: ranging from 4.27 to 19 H_Z and three seed level heights under the barrier (above the bottom of the hopper) from 1.5 to 4.5 cm and four opening gate dimensions (geometry groups), for two crosses of maize: Single cross 10 (S.C.10) and Double cross 162 (D.C.162) and two varieties of field bean (Giza 716 and Sakha 2).

The lowest values of static coefficient of friction were on galvanized iron followed by mild – steel, and the highest on plywood, and for the painted surfaces. The values of static coefficient of friction were: on oven - baked enamel paint < untreated (mild steel),< mutt paint < polish paint.

The results showed that the desired number of seeds/min for the mentioned crops could be obtained from feed rate settings for each variety individually. The results also showed that the vibration frequency 12.2 Hz and the seed level height under the barrier (1.5cm) had the comprehensible treatment for all the measurements.

Analysis of the performance tests of the vibration seed mechanism (seeds rate, seed spacing, germination and emergence) showed good results. The vibration seed mechanism attained the desired amount of the above mentioned factors from a wide range of combination treatments. There was no seed damage among the seeds.

The change in vibration frequency of the seed feed mechanism had a direct effect on seed discharge.

Keywords:
Seed metering device, Vibration frequency, Sowing machines, Planting equipment, Seed feed mechanism.

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