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ABSTRACT

The main experiments were carried out in Agricultural Engineering Institute workshop in El- Dokki, Cairo, Egypt, and Agricultural Research Center (ARC) in 2017, Ministry of Agriculture to manufacture an innovated machine for extracting pomegranate seeds distinguished of high productivity, simple design and low seed damage. The extraction machine was depending on an innovative system to extract the seeds from the peels and flesh. The experiments were carried out on a common cultivar of pomegranate (Manfaluti).

Kinematic analysis was carried out to adjust the extraction machine motion. Kinematics of the sieve motion included the determination of the optimum exciter frequency, method of changing rotor exciter frequency and method of changing separator speed.

Experiments were carried out to study some different operating parameters (exciter frequency, sieve amplitude and rotor separator speed) affecting the performance of the manufactured machine. The machine performance was evaluated in terms of machine productivity, total seed losses, extracting efficiency, specific energy and criterion cost.

The experimental results revealed that machine productivity (0.25 Mg/h), total seed losses (6.01%), extracting efficiency (70.19%), specific energy (8.8 kW.h/Mg) and criterion cost (400 L.E./Mg) were in the optimum region under the following conditions:

- 101.2Hz exciter frequency,
- 40 mm sieve amplitude and
- 200 rpm separator shaft speed.