

ABSTRACT

The present study was carried out to develop and construct a rubbing thresher suiting to some seed crops, in addition to evaluate the performance of the developed thresher by threshing two different crops such as flax and sunflower crops. The performance was evaluated in items of threshing losses, threshing efficiency, visible and invisible seed damage, flax stalk losses, machine productivity, power requirement, and specific energy consumption as a function of change in drum speed, belt speed, concave clearance, and moisture content. The flax experiment was carried out by testing the drum speed at four levels of 4.2, 5.5, 6.4, and 7.3 m/s, four levels of belt speed of 0.42, 0.67, 0.96, and 1.25 m/s, three levels of concave clearance of 1.5, 2.5, and 4.0 cm, and three moisture contents of 11.38, 14.75, and 18.64% w.b. In addition, the sunflower experiment was carried out at the same levels of drum speed and belt speed addition to other three levels of concave clearance of 2.5, 4.0, and 5.5 cm, and three levels of moisture content of 10.51, 16.28, and 20.11% w.b. The results revealed that the threshing efficiency was increased by increasing drum speed, and by decreasing each of belt speed, concave clearance and moisture content. The results showed also that, the drum speed of 7.3 m/s, belt speed of 0.42 m/s, concave clearance about 1.5 cm, and moisture content about 11.38% were the optimum conditions for threshing flax crop. In addition, the optimum conditions for threshing sunflower by the rubbing thresher were 7.3 m/s, 0.42 m/s, 2.5 cm, and 10.51% of drum speed, belt speed, concave clearance, and moisture content respectively.

الموجز

تهدف هذه الدراسة لتطوير آلة دراس لتتناسب دراس بعض محاصيل البذور تعتمد على نظرية الاحتكاك، وتقييم أداء تلك الآلة على دراس محصولي الكتان وعباد الشمس باختبار بعض العوامل التشغيلية مثل سرعة درفيل الدراس، وسرعة سير الدراس، والخلوص بين الدرفيل والسير وكذلك المحتوى الرطوبي عند الدراس، وذلك في تجربتين منفصلتين بناءً على نوع المحصول. في التجربة الأولى تم دراس محصول الكتان عند أربع مستويات من سرعة الدرفيل ٢،٤، ٥،٥، ٦،٤، ٧،٣ م/ث وأربع مستويات من سرعة سير الدراس ٢٠،٤٢، ٢٧،٠٠، ٩٦،٠٠، ١٢٥ م/ث وثلاث مستويات من مسافة الخلوص ١،٥، ٢،٥، ٤،٠ سم وأيضاً ثلاث مستويات من المحتوى الرطوبي للكبسولات وهم ٣٨،١١، ٧٥،١٤، ٦٤،١٨% (على أساس رطب). في التجربة الثانية تم دراس محصول عباد الشمس عند نفس المستويات السابقة من سرعتي الدرفيل والسير وثلاث مستويات أخرى من مسافة الخلوص ٢،٥، ٤،٠، ٥،٥ سم وأيضاً ثلاث مستويات أخرى من المحتوى الرطوبي ١٠،٥١، ٢٨،١٦، ١١،٢٠% (على أساس رطب). وقد أظهرت النتائج أن أعلى كفاءة دراس وإجمالي أقل تكاليف معيارية وأقل فاقد أثناء دراس محصول الكتان كان عند سرعة درفيل ٣،٧ م/ث وسرعة سير ٢٠،٤٢ م/ث ومسافة خلوص ١،٥ سم ومحتوى رطوبي ٣٨،١١%. وأيضاً كانت أعلى كفاءة دراس وإجمالي أقل تكاليف معيارية وأقل فاقد أثناء دراس محصول عباد الشمس عند سرعة درفيل ٣،٧ م/ث وسرعة سير ٢٠،٤٢ م/ث ومسافة خلوص ٢،٥ سم ومحتوى رطوبي ١٠،٥١%.

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