

Abstract

Sunflower is an important oil crop in the world. It ranks the second after soybeans with respect to oil production in the world (Yearbook of Agric. FAO, 1990). In Egypt, 1,129,000 Mg of oils is consumed annually but until now we produce only 153,000 Mg. This means that we produce only about 13.55% of all our needs and import about 86.45% (976,000 Mg). (oilseed situation and outlook 2002).

The main purpose of the present study is to evaluate pneumatic planters suitable for sowing sunflower crop compared with the traditional method, and evaluating the threshing machinery for threshing sunflower heads. In addition to evaluate the drying sunflower seeds losses after mechanical threshing as a suggested solution for increasing the production of sunflower seeds in Egypt.

The results of the present study led to the following points:-

- The pneumatic planter (Kader SPC6) gave the highest values of germination ratio, lateral scattering percentage, power consumption and energy requirement compared with pneumatic planter (Kader SK6) at different planting speed and planting depth.
- The maximum threshing efficiency values of 99.33 and 98.67% for Corn Sheller and El-Shams thresher respectively was observed , at feeding rate of 2.5 kg/min under different sunflower heads moisture content.
- The maximum cleaning efficiency of 97.28 and 87.99 % for El-Shams thresher and Corn Sheller respectively, at feeding rate of 2.5 kg/min under different heads moisture content.
- The lowest values of the total seed losses was obtained at 400 rpm for both type of threshing machines at different feed rate and sunflower heads moisture content.
- The maximum seed damage percentage of about 6.79 and 1.22 % for El-Shams thresher and Corn Sheller respectively, at feeding rate of 2.5 kg/min under different head moisture contents.
- Increasing drum speed from 300 to 600 rpm increased the power consumption from 9.22 to 13.8 kW and from 4.58 to 6.74 kW and energy requirement from 21.45 to 24.19 and from 17.62 to 19.25 kW.h /fed for El-Shams thresher and Corn Sheller, respectively at feed rate of 2.5 kg/min and sunflower heads moisture content of 17.07%.
- The maximum values in criterion cost were of about 229.98 and 130.58 LE/Mg for El-Shams thresher compared with 229.34 and 122.29 LE/Mg for Corn Sheller at feeding rate 2.5 and 10 kg/min, respectively.
- The highest values of the germination ratio after drying were of about 98.54 and 93.96 % for the Corn Sheller and El- Shams threshing machines, respectively. at the minimum air temperature 40 °C (313 K), highest level of feed rate (10 kg/min) and lowest level of moisture content (11.32 %).

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