

DEVELOPMENT OF AN EQUIPMENT FOR CORN SHELLING

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ABSTRACT: A Pakistan corn shelling machine was developed to suit the Egyptian corn varieties and evaluated its performance under different operational conditions to select the optimum conditions for shelling operations of white and yellow corn. Different measurements were achieved included the total grain damage, total grain losses percentage as well as shelling efficiency, sheller productivity (Mg/h) fuel consumption (Lit/h) power requirement (kW), energy requirement kW.h/Mg and costs, the experiments were conducted at four levels of grain moisture contents of 16, 18, 20 and 22% three concave clearances of 35, 40 and 45 mm and four drum speeds of 400, 500, 600 and 700 rpm. (5.03, 6.29, 7.54 and 8.80m/s, respectively), the results indicated that increasing drum speed and decreasing the concave clearance tends to increase the total damage, and shelling efficiency also increase the percentage of total losses at all grain moisture contents for shelling white and yellow corn. The proper conditions for shelling white corn are at drum speed of 500 rpm (5.03 m/s), moisture content of 20% and concave clearance of 40 mm, for yellow corn are at drum speed of 500 rpm (5.03 m/ s), moisture content of 18% and cylinder concave clearance of 40 mm.

Key Words: Shelling, concave clearance, free grain, shelling efficiency, invisible damage.

INTRODUCTION

Corn crop is considered one of the most important grain crops in Egypt. It is used in human feeding, industrial aspects for producing corn oil, starch and dry food for animal. The cultivated area ranges between 1.9 to 2.0 million feddans

yearly with total productivity of about 7.6 million ton of grains. Recently, the government tends to enlargement the growing corn to satisfy the shortage of the wheat production and try to make the self sufficiency for bread by mixing corn with wheat with a percentage