STUDYING CONCAVE-DRUM FACTORS AND OPERATION OF A LOCALLY MANUFACTURED THRESHER AND THEIR EFFECT ON THRESHING EFFICIENCY.

By

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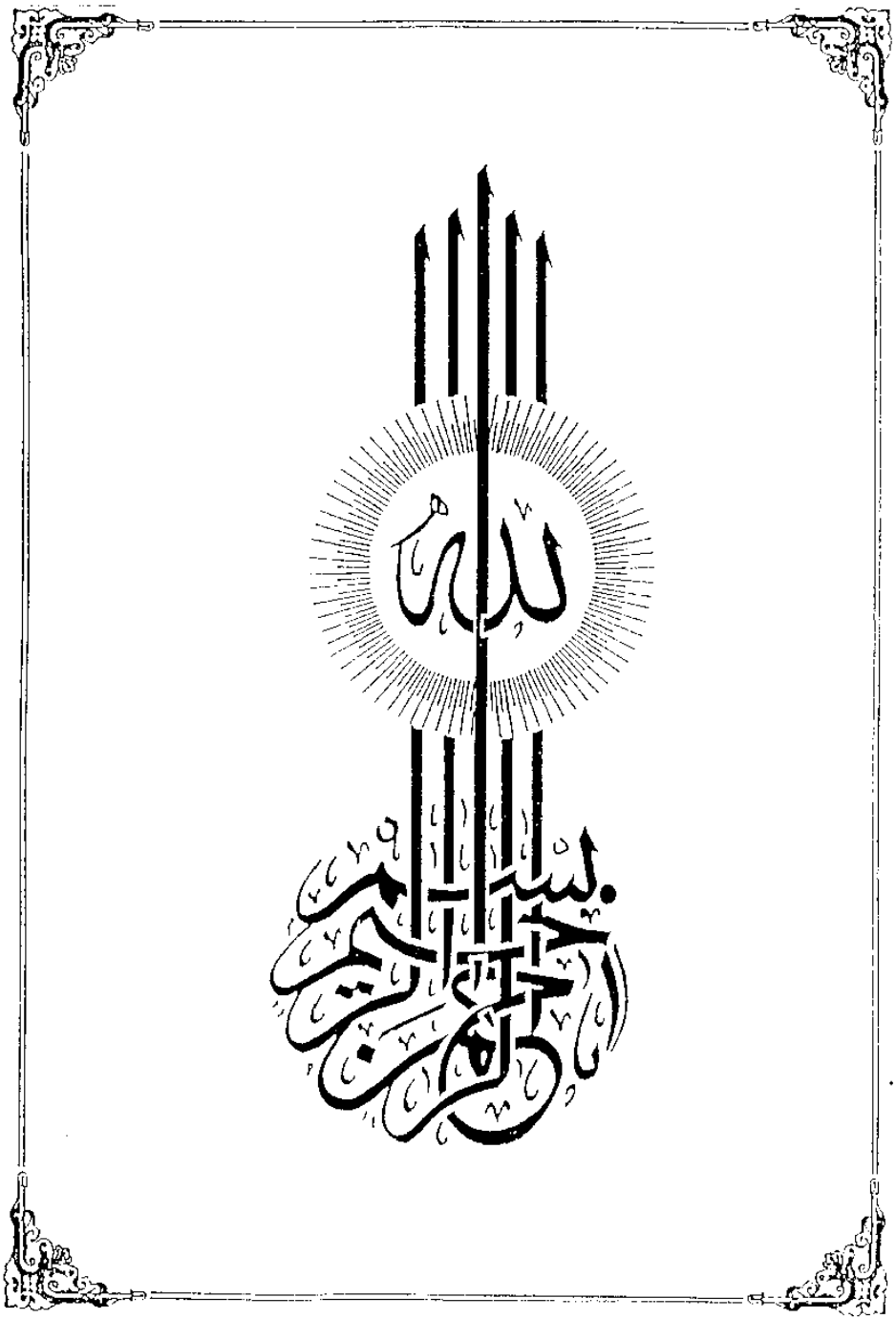

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ABSTRACT

The aim of the present study is to investigate the threshing efficiency of a locally manufactured thresher under affecting factors; concave type; drum-concave clearance; drum tooth dimensions type and drum peripheral speed. Irrespective of feed rate and moisture content. Results obtained showed higher threshing efficiency at higher speeds and at all concave settings. It has a higher value with metal spike-teeth drum than with rubber one; threshing efficiency values were high with the hole concave than

other types on wheat crop and the hole/oval concave has the higher on rice crop and it was higher at 1.5cm drum-concave clearance than the other at the same operating condition. The rubber spike drum gave higher percentage of damaged and husked grain than the metal spike drum for all levels peripheral speeds and at all concave types and settings. However, the percentage of damaged and husked grain was decreased as the effective clearance increased and the peripheral speed decreased.

KEYWORDS.
Threshing - rice - wheat - concave type - drum type - drum tooth dimensions and type - drum peripheral speed - grain output - grain damage - unthreshed grains - milled grains - thrower grains - chopped straw - thrower straw - threshing efficiency.

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INTRODUCTION

I- Introduction

In Egypt, wheat is popularly grown in rotation with paddy, or other cereal grains. Wheat straw is widely used for animal feed. Since wheat straw is brittle at the harvest time, it can be tenderized by beating action of special beater type threshers.Paddy rice straw cannot be chopped or tenderized easily because of it`s highly fibrous straw. Therefore the wheat beater type threshers cannot be used for threshing paddy.

Farmers generally do not have the resources to purchase or hire separate machines for threshing wheat and paddy. The introduction of a muliti-crop engine driven thresher will reduce threshing costs as will as losses for small area.

The stationary thresher is made up of a combination of several different mechanismss, each having a special separate function to perform at the end, the separation of the grain from the straw.

As for combines, which automatically harvest and thresh in the field, their use is very limited that is due to the actual Egyptian agricultural system, all harvester combines consist essentially of a cutting or pick-up mechanism attached to a travelling threshing unit. So that we search for simplify the multi-crop thresher to suit all crops with a simple adjustment. The study was intended to specify some factors as drum-

concave type; drum-concave clearance; drum tooth dimensions and type, peripheral speed of drum of a locally manufactured thresher and their effect on threshing efficiency. The major parts of the threshing unit are the cylinder; and the concaves. Various types are used, but all do the same work with different efficiency.

REVIEW OF LITERATURE

2.REVIEW OF LITERATURE

Whilest threshing is counted as the oldest agricultural operation to be mechanized, it still has some puzzle to be solved. Many investigations were carried out to evaluate the factors affecting threshing with the objectives mentioned in the introduction. The main factors affecting threshing operation may be summarzed as follow:

1) Drum and Concave type.
2) Drum and concave clearance.
3) Drum tooth dimensions and type.
4) Peripheral speed of drum.

2.1) Drum and Concave type:

Stone and Gulvin (1967) shown that three different cylinder types as follows:

1. **Spike-tooth drum.** It is the oldest type; which was used in stationary thrershers that preceeded the combine. It has proved quite satisfactory for threshing most grain crops. The spike teeth, carried in the transverse bars of the cylinder, thresh out the grain as they revolve through similar teeth in the concaves.

2. **Rasp-bar drum.** This type has transverse bars with grooved metal faces. These grooves are cut diagonally, in opposite directions, across adjacent bars. Threshing is