ABSTRACT

The aim of this research is to introduce a combine system for sunflower-heads harvesting to get the oil seeds with the best quality and the highest quantity by the lowest costs for achieving the purpose of this study, it was necessary to modify a small European Combine system which originally designed mainly for harvesting cereal crops, to be suitable for sunflower harvesting. So that, the CICORIA combine harvester (T) type, model longitudinal axial-flow with standard (5) bats reel was use in this study after modification.

Therefore, this research included a study on a primarily field during the harvesting season of (2000); to check and adjust the design balance, operating parameters and performance. On the other hand, the main field-experiments were carried out on the main field during the two harvesting seasons of (2001) and (2002); to investigate the effects of some suggested parameters; machine forward speed, rotor speed, rotor-concave clearance and seed moisture content on both machine performance, crop production, seed losses, energy requirement and costs.

It has been found that the modified combine is useful when it operates at forward speed of (3.3) km/h, seed moisture content of (15.15%), rotor speed of (11.73 m/s), and the first harvesting direction (d_1). The highest effective field capacity of (1.43 fed/h), the lowest total seed losses of (18.47) kg/fed.) and the lowest energy requirement of (8.8 kW.h/ton) with the highest productivity of (2358.95 kg/h) by the lowest cost of (68.05 E/H) were conducted.

CONTENTS

Page