

Salwa Ak1



بسم الله الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني



Salwa Akl

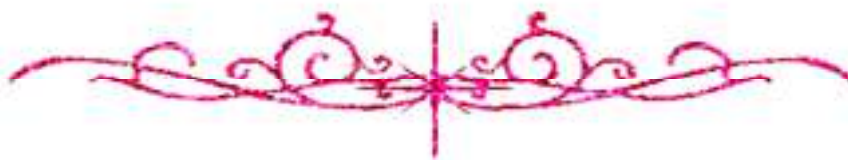


جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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على هذه الأقراص المدمجة قد أعدت دون أية تغييرات



Salwa Akl



بعض الوثائق الأصلية تالفة
وبالرسالة صفحات لم ترد بالأصل



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***A STUDY ON THE ENGINEERING FACTORS
AFFECTING THE EFFICIENCY OF SOME
RECLAIMING EQUIPMENT UNDER
EGYPTIAN CONDITIONS***

BY

ASHRAF EL-SAYED MOHAMED MOSTAFA EL-SHAZLY
B. Sc. (Agric. Mech.), Fac. of Agric., Ain Shams University, 1982
M. Sc. (Agric. Mech.), Fac. of Agric., Ain Shams University, 1991

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

APPROVAL SHEET

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B. Sc. (Agric. Mech.), Fac. of Agric., Ain Shams University, 1982

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This thesis for Ph.D. Degree has been approved by:

Prof. Dr. Maher Ibrahim Mohamed

Prof. of Agric. Eng.; and Vice Dean of Fac. of Agric., Mansoura Univ.

Prof. Dr. Monir Abdo Aziz

Prof. of Soil Science, Fac. of Agric., Ain Shams Univ.

Prof. Dr. Mubarak Mohamed Mostafa

Prof. of Agricultural Engineering, Head of Ag. Mechanization Dept., (Supervisor)

Date of Examination : 11/3/ 1998 .

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Under the supervision of :

Prof. Dr. Mubarak Mohamed Mostafa
Prof. Agric. Engineering, and Head of Agric.
Mechanization Dept. Fac. Agric., Ain Shams Univ.

Prof. Dr. Mohamed Nabil Seif El-Yazal
Deputy of Agric. Eng. Res. Inst., ARC

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ABSTRACT

Ashraf El-Sayed Mohamed Mostafa El-Shazly . A Study on The Engineering Factors Affecting The Efficiency of Some Reclaiming Equipment Under Egyptian Conditions .Unpublished Doctor of Philosophy . University of Ain Shams . Faculty of Agriculture . Agricultural Mechanization Department .

The aims of this investigation were to performance the engineering factors affecting the earthmoving machines productivity as duration time, turning resistance, cutting depth, cutting speed, speed reduction, rolling resistance; and their influences on power requirements, fuel consumption; and machine capacity

Two experimental sites were selected in both Fayum and Nobaria to represent the most common soils of new reclaimed land in both areas . And two different type for earthmoving equipment, bulldozer and elevator motor scraper were used for these equipment .

The important obtained results of the study could be summarized as follows :

* Bulldozer Machine (Fayum site)

- 1- The rolling resistance power is increased by 36.8 and 37.3% when traveling speed increased from 2.6 to 3.8 km/hr and from 3.8 to 5.1 km/hr respectively . The minimum coefficient of rolling resistance for the bulldozer was 0.08 .
- 2- The coefficient of rolling resistance and friction resistance was 0.28 when the forward speed of the bulldozer having 2.92 km/hr
- 3- The speed reduction on working gear (2nd gear) was 9.9, 11.5, 13.5 and 17.2% at drawpower 16.2, 19.4, 23.2; and 21.2 hp respectively .
- 4- The bulldozer develops 23.2 hp maximum drawpower in 2nd gear and specific fuel consumption was minimum equal 0.2 kg/hp .
- 5- The draw pull force was 1200, 1450, 1900; and 2300 kp at cutting depth 3, 5, 8; and 12 cm respectively, and the unit draft has average constant value (0.47) at these cutting depths .

- 6- The turning resistance was 1100, 1600, 1850; and 2400 kp at 30, 45, 80, and 90° turning angle respectively .
- 7- The bulldozer capacity increased by increasing cutting depth and reached maximum capacity at 5.5 cm cutting depth and after that the capacity will be decreased .
- 8- According to the obtained data graphic model (Nomograph) was designed and tested . This Nomograph could correlated bulldozer engine performance, load, forward speed; and fuel consumption during the actual earthmoving operation .

* Elevator Motor Scraper (Nobaria Site)

- 1- The torque transmitted to driving wheel was 13263 and 12820 kp.m at cutting depth 8 and 10 cm with 2250 and 2050 rpm engine speed and the speed ratio obtained for the working gear is 236.8 .
- 2- The rolling resistance power increasing by increasing forward speed and minimum coefficient of rolling resistance was 0.062 .
- 3- The average cutting speed resistance was ranged between 40 to 100 kN/m² at cutting depth 4, 6, 8; and 10 cm on 2nd gear speed .
- 4- The speed reduction increased from 16.2 to 18.9% when cutting depth increased from 4 to 6 cm while by increasing cutting depth from 6 to 10 cm the speed reduction increased from 18.9 to 34.7% .
- 5- The fuel consumption increased by 21.4% when the cutting depth increased from 6 to 10 cm .
- 6- The values motor scraper capacity were found to be 360, 411, 480; and 543 m³/hr at cutting depth 4, 6, 8; and 10 cm respectively during the earthmoving operation .
- 7- According to the obtained data graphic model (Nomograph) was designed and tested . This Nomograph could correlated scraper engine performance, load, forward speed; and fuel consumption during the actual earthmoving operation .

Keywords : Land reclamation, Earthmoving equipment, Bulldozer, Motor scraper, Engine performance, Rolling resistance, Speed reduction, Cutting speed, Cutting depth, Machine capacity .

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