



شبكة المعلومات الجامعية

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شبكة المعلومات الجامعية

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شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغييرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

بعض الوثائق الأصلية تالفة



بالرسالة صفحات نم ترد بالاصل



Faculty of Agriculture

**Cairo University
Faculty of Agriculture**



Cairo University

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UP

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***DEVELOPMENT OF A MACHINE FOR
BRIQUETTING PLANT RESIDUES***

By

Mohamed Mahmoud Ibrahim Ahmed

B.Sc. Agric. (Agric. Mech.), Cairo University, Faculty of Agriculture, 1997

M.Sc. Agric. (Agric. Eng.), Mediterranean Agron. Inst. of Bari, ITALY, 2001

THESIS

Submitted In Partial Fulfillment of
The Requirements For The Degree of

DOCTOR OF PHILOSOPHY

In
Agricultural Sciences
(Agricultural Engineering)

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ABSTRACT

The aim of this study was to develop a machine that deals with the plant residues (cotton stalks). This aim was planned to be realized through consecutive stages and the findings are as follows:

1) Compaction behavior of cotton stalks: the results showed that densities of the compaction material ranged from 958 to 1180 kg/m³. The particles size ranged from 3-mm to 1.4-mm, material is categorized as very compressible. The compaction energy represents about (0.047-0.01) % of cotton stalks energy.

2) Coefficient of friction between cotton stalks grinds and metal surfaces ranged from 0.68- 0.86.

3) From the theoretical analysis of the pelleting process, the required force and power are 3616 N and 3 kW.

4) Numerical analysis by using computer package helped to predict any high stresses before the manufacturing.

5) The machine was operated at speeds 60, 80 and 100 rpm of the main shaft, at different levels of the water content (7, 15, 20%), particle size (0.7, 1.7, 3 mm) and bonded material (molasses 5, 10, 15%). The productivity ranged 56.7, 75.7 and 96.5 kg/h with different speeds

6) Technical and financial evaluation of the machine:

- Using water as bonded material is not good for the quality of the pellet but using the molasses is recommended for good quality of the pellet.
- The heating value of cotton stalks is 3938 kCal/kg and ash content is 3.4 %.
- The total required energy of the pelleting (from the cutting to pelleting process) is 66.35 kW.h/Ton that represents about 1.45 % from the total energy of cotton stalks.
- The total cost of the machine is 10 LE/h. The IRR is 52% and NPV is 3139.19 LE. The pay pack period is 2.65 year.

محمد



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