DETERMINATION OF EFFECT OF MOISTURE CONTENT AND SURFACE MATERIAL ON ANGLE OF REPOSE OF GRAINS

BY

ABUBAKAR ABDULKADIR

2001/11365EA

DEPARTMENT OF AGRICULTURAL ENGINEERING SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY.

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November, 2007
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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
NIGER STATE

A FINAL YEAR PROJECT SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF
BACHELOR OF ENGINEERING (B.ENG) AGRICULTURAL
ENGINEERING.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

NOVEMBER, 2007
DECLARATION

I hereby declare that this project is a record of a research work that was undertaken and written by me. It has not been presented before for any degree, diploma or certificate at any university or institution. Information derived from personal communication, published and unpublished work of the others were duly referenced in the text.

Abubakar Abdulkadir

07/01/2008

Date
CERTIFICATION

This project entitled determination of effect of moisture content and surface material on angle of repose of grains undertaken by Abubakar Abdulkadir meets the regulations governing the award of the degree of bachelor of Engineering (B.ENG) of the Federal University Of Technology, Minna, and it is approved for its contribution to scientific knowledge and literary presentation.

Engr.Dr.(Mrs.) Z.D. Osunde
Supervisor

Date.

Engr.Dr.(Mrs.) Z.D. Osunde
Head, Department of Agricultural Engineering

External Examiner

Date.
DEDICATION

This project is dedicated to my late grandmother Hajiya Hajarah Abubakar and the entire Badaru families.
ACKNOWLEDGEMENT

My sincere gratitude goes to the Almighty God for his assistance throughout the course of my studies and for his promise to see me through the course of my life in this University so may it be!

The road would have been so rough than this if not for the assistance of so many people, I gave praise to ALLAH for touching the heart of these people to rise to my need and made my University education a reality.

Firstly, I am sincerely grateful for the immense contribution of my parents Mr. and Mrs. Badaru U. Abubakar for their moral, financial and spiritual support. The same gratitude goes to the entire family of Mr. and Mrs. Shuaibu Abubakar, Abdullateef Abdulmajeed, Khadijat Hauwa with special gratitude to Dr. Badaru S. Abubakar, Mr. Abubakar Suleiman, Mr. Badaru I. Abubakar, Mr. and Mrs. Abubakar Musa Idigede Mr. Badaru Abdulsalam Abubakar and others.

Secondly, I am indebted to my project supervisor and the same time the H.O.D. of my department Dr. (Mrs.) Z.D. Ounde for her guidance and technical advice in my write up. The same gratitude goes to Professor Ajisegiri, Professor M. G. Yisa, Dr. O. Chukwu, Dr. Donald Agdizi, Engr. Solomon Dauda, Mr. Segun Adebayor and other lecturer in the department for their contributions towards my success during the program.

My special gratitude to goes my uncles, brothers, sisters, who in small measure have contributed either directly or indirectly to the success of my University education both financial and morally, they are Aunty Fatima Mohammed Ndagi, Halisat Abubakar, Brother Garba Ibrahim and others. I am gratefully and appreciative for the assistance of my friends
for their moral and spirituals support. They are Ogunrinde Emmanuel Abiola, Olatunbosun Samuel, Mr. Abdulsalam Nasir, Mr. Adeyemi Akinsonya and many others like my childhood friends.
ABSTRACT

A measuring device for angle of repose of grains was designed and constructed using readily available and affordable materials. The two basic types and other simple methods of measuring angle of repose of solid bulk grains were discussed. The comparism between the two basic types of measuring angle of repose of grains and the comparism between repose angle and internal angle of friction were also discussed. The effect of some physical properties of granular materials on angle of repose and the possible problem associated with bulk solid flow were addressed. The effect of moisture content and surface material on angle of repose was determined. The application of repose angle on design of agricultural structures such as silo, bin, hopper, chote and other storage equipment was also discussed in detail. Recommendations for possible modification of the device were suggested.
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