EFFECT OF SURFACE TREATMENT OF BAGS ON THE PROTECTION OF BAGGED FOODSTUFFS

BY

Mawaheb Mahmoud Zewar

(B.Sc.)

A Thesis

Submitted in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE

in

Pesticides

Plant Protection Department

Faculty of Agriculture

Ein Shams University

1974

APPROVAL SHEET

Title of Thesis	:	The effect of surface treatment of bags on the protection of bagged foodstuffs.:
Degree	:	M.Sc.
Name of the Student	:	Mawaheb Mahmoud Zewar B.Sc. Agric. 1965 (Ein Shams University).
Institute	:	Faculty of Agriculture (Ein Shams University).
Department	:	plant protection

This thesis for the M.Sc. Degree has been approved by :

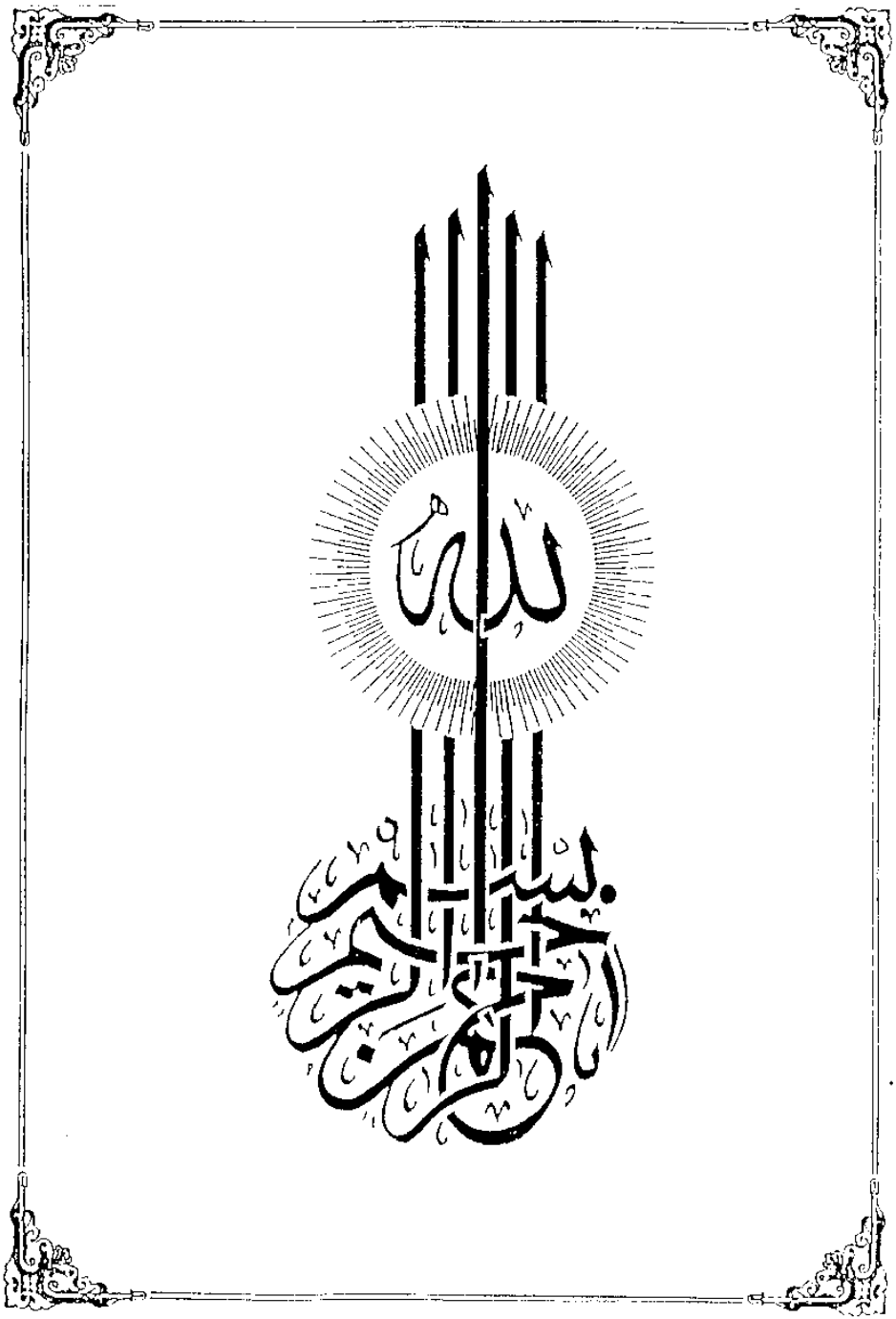
.....

.....

....A. Badawi....

(Committee in Charge)

Date: 11 / 6 / 1974.



ACKNOWLEDGEMENT

The writer wishes to express her sincere gratitude to Prof. Dr. M.S. El-Rafie, Vice Dean and Head of Plant Protection Department, Faculty of Agriculture, El-Zagazeg University; to Prof. Dr. A. Badawy, Head of Plant Protection Department, Faculty of Agriculture, Ein Shams University and Dr. A.H. Kamel, Director of Stored Products Research Section, Entomological Research Institute, Ministry of Agriculture, for their careful supervision, guidance and helpful suggestions.

OBITUARY

The writer was deeply grieved to learn of the death of Prof. Dr. M.S. El-Rafie on April 25, 1974. Prof. Dr. El-Rafie has taken the biggest share in preparing this thesis. His sudden death had been a great shock to me and to all who knew him.

I really know what a dreadful tragedy this must be for his wife and kids and hope it may be some little consolation to them to know that all his students and colleagues are thinking of them and sharing their grief.

- - - - - - -

CONTENTS

PART III

PART IV

PART V

Losses in stored food products have not been accurately estimated in most countries up to the present time. Several factors are involved in the deterioration of produce ,and it is difficult to make an assessement of the actual losses due to each factor. However, not less than 5 % of the world production of foodstuffs is lost due to insects attack. Taking into consideration that the population of Egypt is round about 35 millions; this amount (5 % loss) if saved, would supply the food needs of another 1.75 millions. This figure may increase if account is taken of the additional depreciations done by other biological factors.

The types of deterioration and rates of loss differ greatly according to the method of storage and moisture content of grain. A brief note on the methods of storage used in Egypt would be of interest and can accordingly be summarized in the following :-

A- Storage in Shounas.- (open air storage)

In its simplest form, the shouna is no more than a piece of land surrounded by walls or fences of barbed wire, wood or iron. There, the different kinds of grains

[illegible] in different weather conditions, stages of [illegible] rats and insect pests. Bags are transferred directly to stacks in burlap bags shortly after their receival in the shouna. To minimize losses due to rainfall in some parts of the country, the construction of cement or asphalt floors, roofs and sheds is undertaken. This method now-a-day accounts for the storage of the majority of cereal and pulse grains produced locally or imported, besides most of imported flour.

B- Room-type stores and warehouses

Room-type stores are common in villages where farmers store their crops. They are built of unbacked bricks or mud mixed with chaff.

Warehouses are mainly associated with flour and rice mills and at sea ports where large amounts of grains and flour are received.

In case of open air or wire mesh storage, grains are packed and stored in jute bags. Cotton bags are, however, used in packing flour.

C- Underground storage

This method is confined to limited areas; in certain villages near the desert, in the oasis, in rainless regions - all being far from infiltration of water - as well as in parts known to be free from termites. Grain should be dry enough before storage so that it could be safely stored for several months.

Field bean is stored extensively in underground pits. These are nearly conical in shape, two meter in diameter and three meters in depth. Grain can be either introduced or removed through a top opening. Due to the accumulation of carbon dioxide, produced through the respiration of grains and insects in the closed pit, the infestation is put in check.

D- Storage in country bins

These are home-made baby bins, about one ton capacity each, built of mud mixed with chaff. They are placed on the roofs of farmers houses all over the country. Groups of country bins made of bricks, 15 tons capacity each, were built by the Government and are located in 21 parts of the Delta. All of them hold about 44.000 tons.

E- Terminal elevators

Two terminal elevators have been constructed in Egypt, the first one in Cairo (58.000 tons capacity), the other one in Alexandria (48.000 tons capacity).

F- Future program for grain storage

A new project of grain elevators and warehouses having a capacity of 100,000 tons have been adopted. It is hoped that this project will be finished in the very near future.

From the above mentioned points, it could be concluded that grain storage in jute sacks and storage of flour in cotton bags are still the dominant methods of storage in Egypt. Under such conditions, stored materials are much more susceptible to insect infestation and different types of deterioration.

The following protective methods are commonly undertaken to safeguard stored grains :-

1) Disinfection of shounas, either by natural means (exposure to sun) or by burning (flame throwers). 2) Disinfection of stores, warehouses, transport vehicles, threshing and sieving machinery by spraying. 3) Disinfection of second hand bags either by physical means (i.e. dipping in boiled water) or by chemical means (i.e. fumating or

fumigation). 4) Use of grain protectants either in the form of seed dressings or as sprays. 5) Periodical dusting or spraying of the free-infested stack with a residual insecticide.

As a matter of fact the preceding measures proved not to be satisfactory. Still there is a need for more effective methods for the protection of stored grain.

Surface treatment of food packages by insecticides was recommended as a method for the prevention of insect infestation and is commonly used in many parts of the world. Moreover, the use of insect-proof food packages has been evaluated in many countries. In Egypt, however, very little work has been carried out on this subject. No data on long-term storage of grain and the comparative effectiveness of insecticides applied to food packages are available.

For this reason, it was thought advisable to study the possibility of improving storage conditions and the additional protective methods which may be undertaken through the treatment of jute and cotton bags used for the storage of grains and grain products.