FOOD RESEARCH INSTITUTE

FACTORS ASSOCIATED WITH MAIZE STORAGE TECHNIQUES AT FARMERS' LEVEL IN THE CENTRAL REGION OF GHANA

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Summary

A study was carried out on the maize storage methods of farmers in the Gomoa Mprumem area of the Central Region of Ghana where maize production is high. Four types of maize storage methods were identified: Traditional crib, Modern ventilated crib, Bag storage and Room storage. The insecticides identified with farmers' storage of maize were: Gammalin 20 (Lindane Hexachlorocyclohexane), Gammalin A dust (Lindane), Lindane dust, Actellic 25 (Pirimiphos-methyl), Phostoxin (Aluminium Phosphide) and Andrex 40 (Aldrin)

No significant difference ($P > 0.05$) was found between age of farmers and their storage practices. There was however a significant difference ($P< 0.05$) between maiz acreage and methods of storage.

Product-moment correlation analysis showed that adoption of Improvements of storage techniques poorly correlated with age of farmers ($r = 0.05$) but fairly correlated with farmer's education ($r = 0.39$) and his social participation.

Introduction

The poor storage practices of farmers in Ghana have been attributed to the following reasons (Anthonio, 1963):

Lack of knowledge of improved storage practices

Poor production

Lack of funds

Storage expenses

Deterioration of stored products.

However, these are generalised facts which may not totally affect the adoption of improved storage practices. Certain peculiarities of farmers had been shown to relate to the adoption of improved farm practices (Wilson and Gallup, 1955). The include education, size of farm, contact with extension agents and economic status. This assertion has been corroborated by Van den Ban (1957)

who found hat progressive farmers were young, had received Vocational training in Agriculture and were members of farmers' organisations. Although further credence to this was rendered by the work of Bose (1961) who found that in India, farmers who were more receptive to changes belonged to the higher castes were literate and had higher Participation in Community Activities. Rahudkar (1962) showed that there was no relationship between adoption of recommended farm practices and age of farmers, their social status and the size of farm operated by each farmer.

A large volume of research work has been carried out on improved crop Storage Techniques at farmer's level which are supposed to have been passed to
farmers. Yet, not much work has been done to ascertain the level of adoption of these practices by farmers. A study was therefore conducted on the maize storage techniques of farmers in areas where maize storage had received much attention for a long time from the Food Research Institute (CSIR). The objectives of the study were:

(a) To study the relationship of farmer's characteristic with their methods of maize storage

(b) To find out farmers knowledge of maize storage practices and their sources of information on them.

(c) To identify various insecticides used by farmers in maize storage.

(d) To suggest ways of gearing up Crop Storage Extension Services in the Region.

Materials and Methods

The investigation was carried out in Gomoa Area of the Central Region noted for maize cultivation. Samples were drawn from 9 villages, which include: Swedru, Winneba Area, Pomadze area, Gomoa Mprumem, Gomoa Potsin, Ojobi, Oguakrom, Gomoa-Brofoyedru and Gyahadze. In all, 100 farmers were randomly selected and interviewed with the aid of questionnaire.

Social Participation:

This was measured as the number of Voluntary Organisations within and outside the village system in which the respondent is a member. The score ranges from 1 to 21. Total score for individual was calculated by summing the weights of the individual statement responses.

Adoption of Improved Storage Practices:

Improved storage practices involved three basic things:

1. Treatment of store before filling basic things:

   Three types of insecticides were identified for this purpose.

   The scale was scored as follows:

   Non – use = 0

   Gammalin 20 = 1

Gammalin/Lindance dust	=	2
Actellic	=	3

This scaling was based on the reported effectiveness and safety of these insecticides. The insecticide with the highest effectiveness was rated most. Insecticidal toxicity was also considered in the scaling. The insecticide with highest residual effect was scaled least.

2. Treatment of maize.

   Scaling followed the same reasonings as outlined in (1).

3. Types of storage technique.

   The Scaling was scored as follows:

Room Storage	=	1
Traditional Crib	=	2
Modern Crib	=	3
Bag Storage	=	4

The scaling was based on the ease of management. Bag storage of maize was assumed to be more difficult to handle. The highest possible score for individual respondent is 11.

Analysis of Results:

The various primary data collected were subjected to analysis of variance, 'T' test; and Pearson (r) correlation (Blalock 1972, Siegel 1959).

Results and Discussion

Maize Storage Methods:

Data presented in Table 1 reveals that only 4 percent of the candidates farmers used Modern Ventilated Crib for maize Storage. This is the ideal recommended farm and village maize storage method. Although farmers in the study area had been exposed to this method for sometime, the use of the traditional crib by 18% of the farmers might not be unconnected with lack of knowledge of improvements to the traditional cribs and may also be due to financial constraints. The most popular storage practices (70%) was for maize-on–cob to be stored in rooms where there is usually little ventilation. The farmers that used this method had indicated that maize stored under this condition is easily attacked by rodents, insects, and moulds. There appears a need therefore to make the farmers conscious of the disadvantages of storing maize in rooms.

TABLE 1

DISTRIBUTION OF FARMERS ACCORDING TO THEIR MAIZE STORAGE METHODS

Storage Methods	Percentage
Modern Crib	4.0
Traditional Crib	18.0
Bag Storage	4.0
Room Storage	70.0
Not Stored	2.0
No Response	2.0
Total	100.0

TABLE 2

DISTRIBUTION OF FARMERS ACCORDING TO INSECTICIDES USED IN STORAGE

Insecticides	Percentage
Did not use any Insecidicides	38.0
Phostoxin	3.0
Gammalin 20	13.0
Actellic	9.0
Lindane Dust	7.0
Gammalin Dust	29.0
Andrex 40	1.0
Total	100

TABLE 3

DISTRIBUTION OF RESPONDENT FARMERS ACCORDING TO THEIR SOURCES OF INFORMATION OF MAIZE STORAGE PRACTICES

Sources of Information	Percentage
Min of Agric Extension Agent	47.0
Friends and Neighbours	39.0
Advisory	1.0
Private Extension Agents Or private Firm Salesman	2.0
No Response	6.0
Don't Store	2.0
Total	100

Farmers ' use of Insecticides

The use of insecticides by the farmers on stored maize creates some concern. It was quite disturbing to note (Table 2) that 13% of them treated their maize with Gammalin 20. The toxicity and residual effects of this chemical in this formulation are such that it should be discouraged in grain storage. Twenty-nine percent of the farmers used Gammalin dust. This is also not a healthy practice as previous work has shown that maize so treated would not be fit for consumption until after 3 months (Nyanteng, 1970). Many stored products insects have been known to develop resistance to Gammalin dust (Delina, 1972. Boshoff and Caswell 1976).

The low percentage of farmers that used Actellic and Phostoxin (9% and 3% respectively) is an indication of lapse in the farmers' knowledge of the recommended and appropriate insecticides to use. This probably confirms the general notion that there is a gap between research and extension with the result that research findings do not sufficiently get to the farmers who are the users of such results.

Sources of Information on maize Storage Practices

One of the major sources of information improved agricultural farm practices has been identified as the contact of Extension Officers with farmers (Williams 1969, Patel 1978) and the result of this study confirms that 47% of the farmers obtained their information from Extension workers of the Ministry of Agriculture. Thirty nine percent of them obtained similar information from friends and neighbours. The role of radio and advisory pamphlets in passing information to farmers on improved storage practices was not appreciable. Although the use of radio and redifussion by farmers has been reported as a very popular source of information on farm practices (Williams, 1969) our findings suggest inadequate attention to crop storage technology in the areas where radio programmes are popular on farming.

Influence of Certain Variables on Maize/Storage Practices

The mean age of farmers who used various methods of maize storage is given below:

Groups of Farmers	Mean Age in Year
1. Those who stored in Traditional crib	37.80
2. Those who stored in Modern crib	40.00
3. Those who used bag storage method	42.17
4. Those who used room storage method	41.60

Analysis of various indices revealed no significant relationship between age and method of storage.

The mean acreage put into maize by farmers who used different methods of maize storage is given below:

Group of Farmers	Mean Acreage
1. Those who stored in Traditional	9.17
2. Those who stored in Modern Crib	50
3. Those who used bag stored method	18
4. Those who used Room storage method	25

The result of the statistical analysis showed that acreage is significantly ($P < 0.01$) related to the type of storage methods adopted.