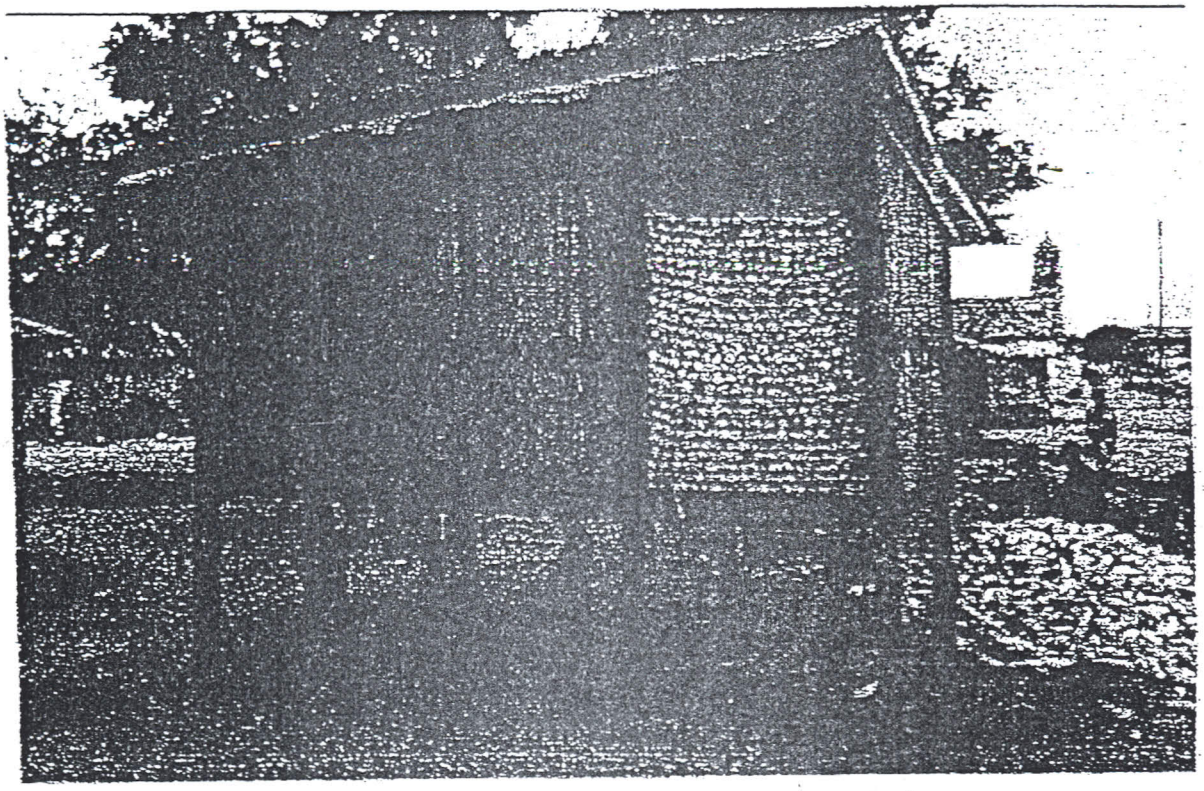
RESEARCH AND EXTENSION ACTIVITIES CARRIED OUT BY THE MAIZE STORAGE TEAM OF THE FOOD RESEARCH INSTITUTE (CSIR) OF GHANA FROM 1981 TO 1992



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Compiled

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ABSTRACT

The paper examines research and extension activities carried out by the Maize Storage Team of the CSIR-Food Research Institute from 1981 to 1992. The team worked in collaboration with the Ministry of Food and Agriculture (MoFA) in five villages: Potsin, Ojobi, Oguakrom, Gyinadze, Gomoa-Mprumem, in the Awutu-Efutu-Senya and Agona Districts of the Central Region, with the view to help farmers adopt the improved crib for drying and storing maize. Farmers response and comments on adoption rate as well as problems faced by the Project Team are documented and recommendations are made for any future follow-up work.

Chapter 4

EXTENSION ACTIVITIES BY THE FRI MAIZE STORAGE AND THE MINISTRY OF FOOD & AGRICULTURE ON ADOPTION OF THE IMPROVED MAIZE STORAGE CRIB IN FIVE VILLAGES IN THE CENTRAL REGION

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(Sponsored by the DAPIT project of the Ministry of Environment, Science and Technology)

4.1 Introduction

This chapter gives a description of attempts made and problems encountered the FRI Maize Storage Team ,working in collaboration with Ministry of Food and Agriculture, MoFA, Winneba District, between 1986 -1988, to encourage maize farmers in five villages in the Awutu-Efutu-Senya and the Agona Districts to adopt the improved crib for drying and storing maize. The villages were Potsin, Ojobi, Oguakrom, Gyahadze, Gomoa-Mprumem. Two demonstration cribs were built in each of the villages for maize farmers in the selected villages.

4.2 Methodology

The five villages were selected at the initiation of the District Agricultural Extension Officers in the Awutu-Efutu-Senya and the Agona Districts. The selection was based on the fact that the maize farmers in these villages had been organised into co-operatives. They were also involved in the maize production improvements scheme being oragnised by MoFA in collaboration with the Sasakawa Global 2000 Project.

Initial contacts were made by the District Agricultural Extension Officers. Subsequently, the group met the farmers in each village on separate occasions, interacted with them and explained the rationale of building the demonstration cribs to them.

All the cribs were built from sawn timber, roofed with corrugated aluminium sheets and reinforced at the legs with concrete cement. The storage compartment of each crib measured. The capacity of each crib was such that it could contain 20 to 25 maxi bags of shelled maize.

The farmers were also encouraged to organise themselves to build cribs based on the following plan:

- Select a suitable site for the erection of the crib; site should be free of grass, standing water and located away from buildings
- Recommended dimensions for an improved crib were width 1.0-1.2 m, height of floor of crib 1.0 m and with 50 % wall openings
- All legs of cribs should have anti-rodent guards installed.
- The crib must be located in such a way that its long face is towards the prevailing wind.
- The maize must be harvested at the right stage of maturity.
- The maize must be treated with an effective insecticide like Actellic 25 before storage.
- The area around the crib must be kept clean of waste, grass, bushes, etc.

4.3 Farmers Response and Comments on Adoption Rate

When the project was initially introduced to the farmers, there was a lot of enthusiasm. Unfortunately some of the farmers began showing apathy after sometime. It was apparent that the farmers misconstrued the main purpose of the crib. They thought farmers were being asked build cribs with the same material as the demonstration cribs. The only exception was

with farmers at Ojobi, where the team found them not only well organised but to be very supportive of the project. A number of cribs (Fig. 4.2) were constructed by the farmers based on the recommendation of the team. In other areas, adoption of principles were clearly a problem as shown in Fig. 4.3. On the whole one could say the adoption rate was rather poor given the initial enthusiasm and the amount of effort put y the project team.

4.4 Problems Faced by the Project Team and Recommendations

A number of problems affected this particular project of helping farmers to adopt the improved crib. The key problems were finance, transportation and wrong perceptions by the farmers.

Even though the project was financed initially by the DAPIT project of the Ministry of Environment, Science and Technology, the latter also had problems accessing funds from the government. Oftentimes funds were released very late. Timely release of funds could have helped achieve a better impact of the project.

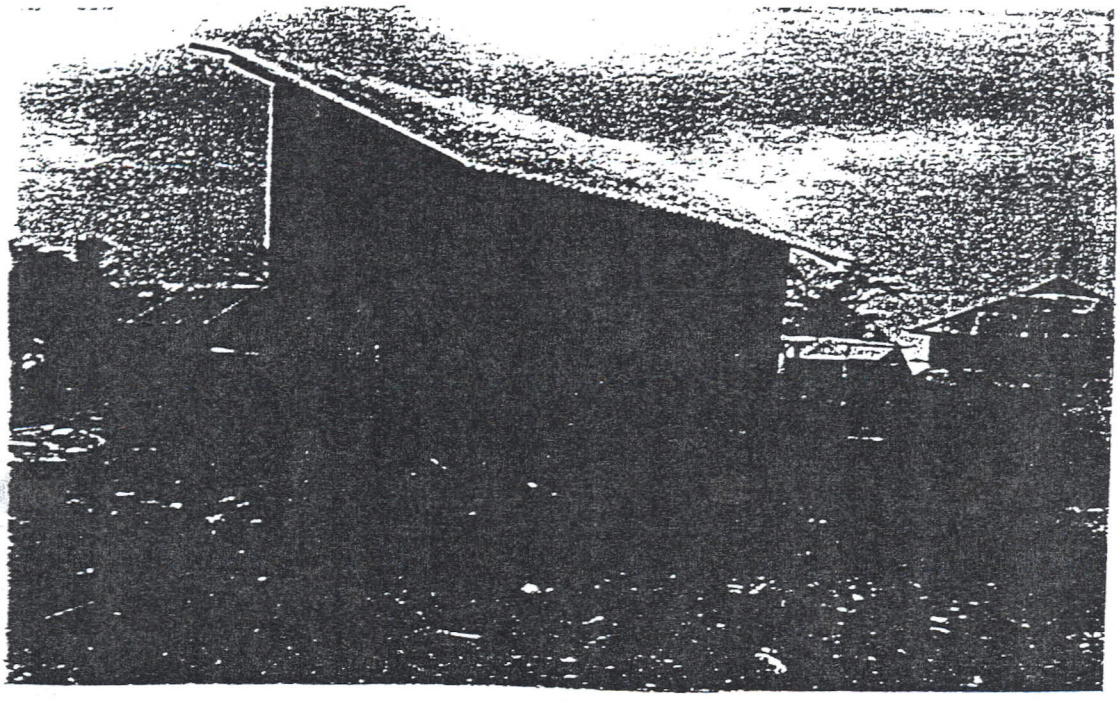
Secondly, the team had a number problems with the vehicle assigned for the project. The vehicle broke several times because of age. As result scheduled work and follow up visits to project sites were not done on time. There were many times the project could visit farmers long after the harvest had been done. So it was possible to encourage farmers to adhere strictly to principles and practices that the project intended them to adopt. It is recommended that adoption projects needs ready money for proper following up studies to help the farmers.

The third major problem was the wrong perception developed by the farmers against the use of sawn timber and aluminium roofing sheets for the construction of the demonstration cribs. These materials were used so as to enable the demonstration to last as long as possible. Unfortunately, most of the farmers misconstrued this to mean that the project team

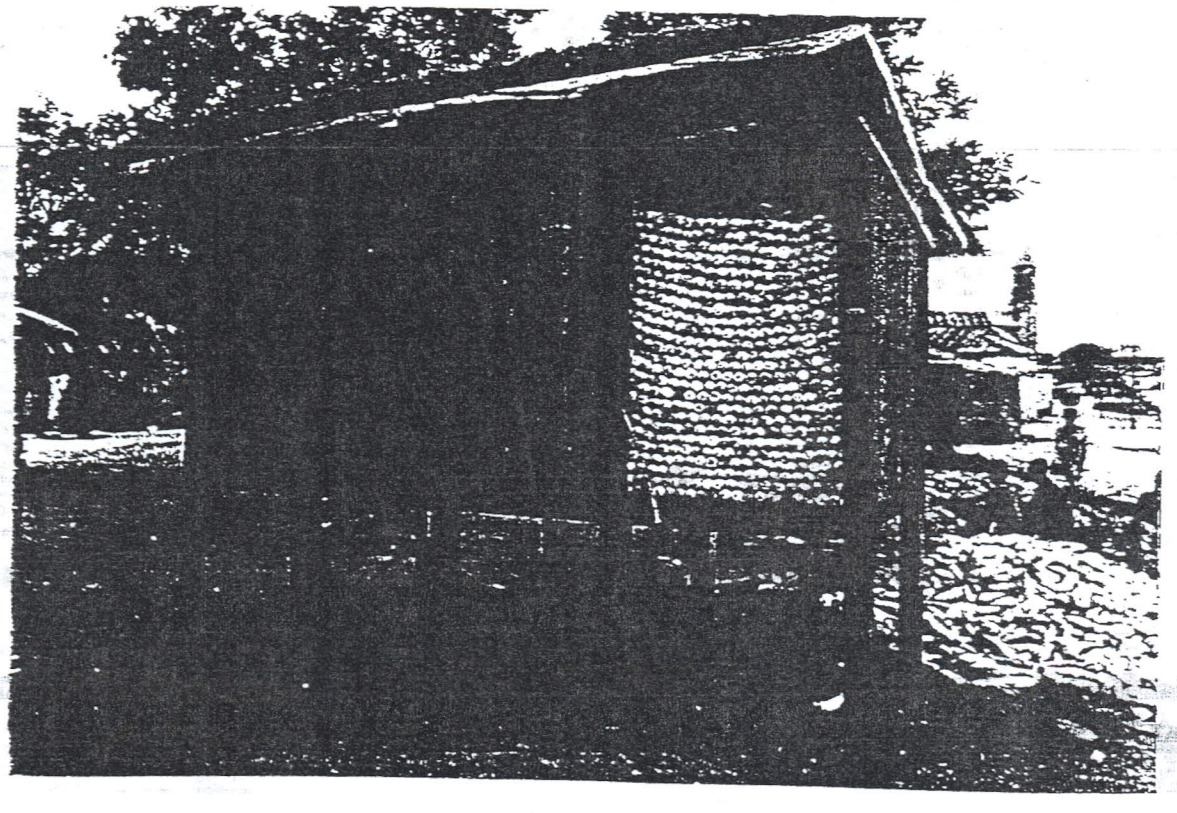
wanted them to use the same materials for the construction their cribs. The project took steps to correct when Sasakawa Gobal 2000 Project Team offered to finance the construction of a demonstration which had less wood and was roofed by thatch with some modifications as shown in Fig 4.1b. It is hoped subsequent attempts at introducing this or a similar technology to farmers would take into consideration the problem the team faced in this work.

FIG. 4.1

TWO DEMONSTRATION CRIBS BUILT IN THE CENTRAL REGION BY THE FRI MAIZE STORAGE PROJECT TEAM



Demonstration Narrow crib at Oguakrom Village, Winneba District
(Materials: Sawn Timber, Aluminium Sheet Roofing; Slats: Wawa



Demonstration Narrow Crib at Ojobi, Winneba District
(Materials: Sawn Timber, Thatch Roofing with Polythene Sheet Cover; Slats: Palm Tree Strands)

FIG. 4.2

OJOBI FARMERS ADOPTING A DEMONSTRATION CRIB BUILT BY THE FRI MAIZE STORAGE TEAM IN THE WINNEBA DISTRICT, CENTRAL REGION

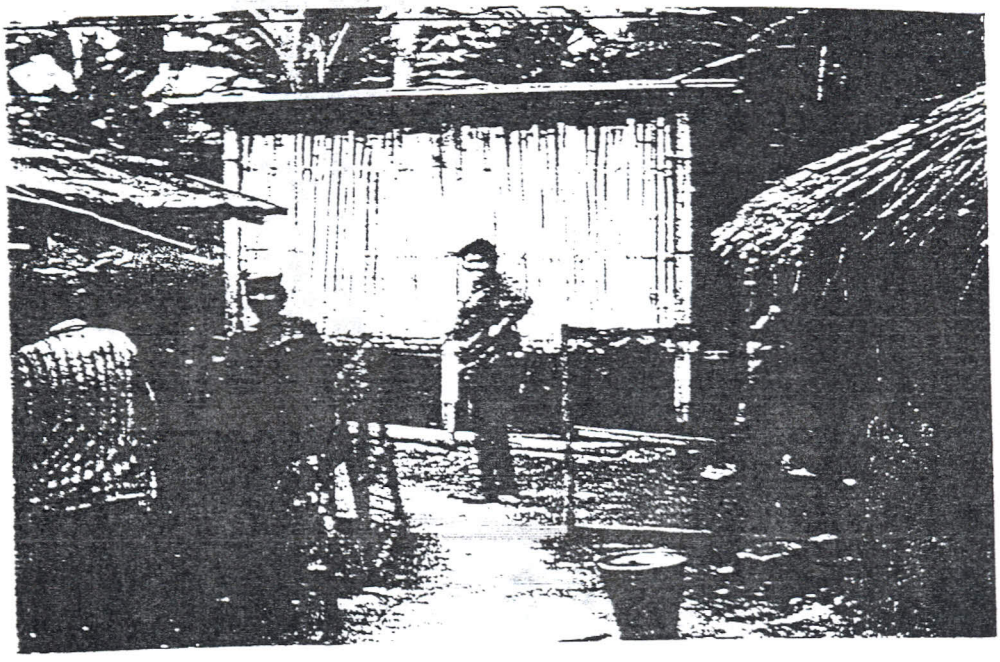
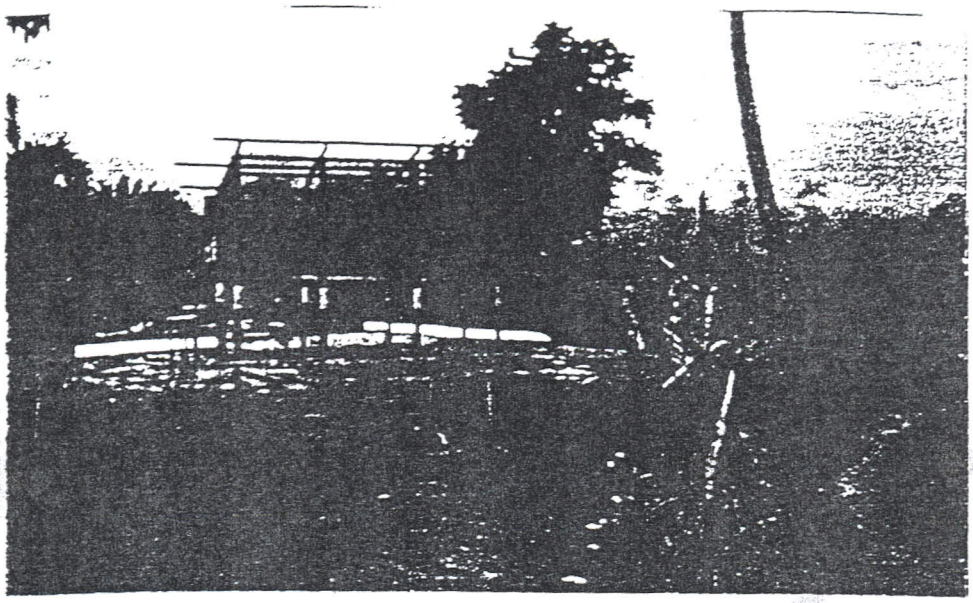


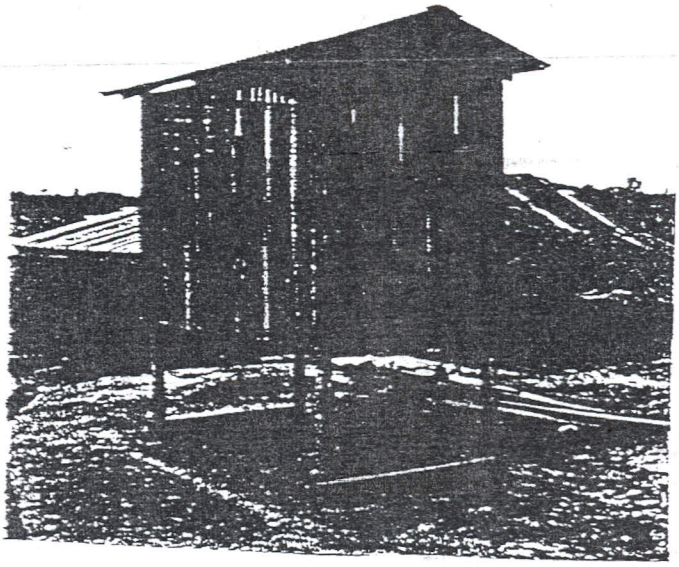
FIG. 4.3

ADOPTING THE DEMONSTRATION CRIB: PROBLEMS WITH SITTING



Waterlogged Area

Weedy Area



Compound of a Settlement

Chapter 5

ADOPTION OF THE IMPROVED MAIZE STORAGE CRIB BY THE SMALL-SCALE FARMER IN GHANA: PROBLEMS AND PROSPECTS

(P-N. T. Johnson, M. Halm & K. Vowotor)

(This paper was presented at the 16th Biennial Conference of the Ghana Science Association, held at University of Cape Coast, 5 - 9th, June, 1989)

5.1 Summary

This paper briefly examines some technical, socio-economic and cultural problems which appear to hinder the extension of the improved maize storage crib to the small-scale farmer in Ghana. These were problems identified by the Maize Storage Team of the Food Research Institute during its work in some of the main maize-growing areas in the Central Region. Problems like the traditional practice of using the underneath of the crib as a kitchen, the storability of newly introduced high yielding maize varieties, application of insecticides and the amount of loss which the farmer considers tolerable have all been examined. Some recommendations have been made which hopefully will help develop better approaches towards extending the improved maize storage crib.

Key Words: maize storage, improved crib, small-scale farmer, socio-economic factors

5.2 Introduction

As part of the general programmes to improve the maize industry in Ghana, the Government has recently obtained foreign assistance to increase the maize storage capacity of the Ghana Food Distribution Corporation from 17, 000 metric tonnes to 120,000 metric tonnes. This is being done in anticipation of increased maize production from an annual average tonnage of 1.2 to 5 tonne per hectare. This anticipated increase in maize production is due

to efforts being made to improve extension work for farmers, such as the Sasakawa Global 200 Programme.

It is estimated that the Ghana Food Distribution Corporation would be able to handle about 15 % of the total maize produced in the country. This means that the remaining 85 % would have to be managed on small storage holdings by individual farmers themselves.

In the Ghana Agricultural Policy of 1982, the Government reiterated that it is committed to self-sufficiency in the production of cereals especially in maize. This called for maintenance of adequate buffer stocks for price stabilisation and food security. It is for the these reasons why the present attempts at introducing the improved maize storage crib, also referred to as the narrow crib have special significance.

5.3 The Improved Crib

The Improved Crib looks like the traditional Ashanti Crib and is usually rectangular in shape (FAO, 1985). The FRI Maize Storage Group, sponsored by the DAPIT Project of the Ministry of Science and Industry have been studying and working, in collaboration with the Extension Division of the Ministry of Agriculture, Winneba District. The work involved the design, construction materials used, capacities and location of the traditional crib. and efficiency. The Improved Crib was therefore introduced with the following advantages over the traditional ones:

- It is strong, durable structure having a life span of about 10 years if well constructed.
- Locally available materials like thatch, bamboo can be used for nearly 100 % of the structure.
- It is easy to load and unload.

- It can be used for drying as well as storage of maize.
- It can be fitted with rat-guards to make it rodent-proof.
- The wall structure protects the maize from the sun, rain and can be locked to protect against theft.
- Its maintenance cost is very low

A very important feature of the improved crib is its width, which should be between 1.0 to 1.5 m under climatic conditions in the Winneba District. The height of the crib floor was 1.0 m above the ground and all its legs were fitted with rat guards. It should be placed in a site with one facade facing the prevailing wind or perpendicular to the direction from where the wind blows, since wind velocity and frequency are important factors for a good drying performance. The site and nearby area must be well cleared to prevent insect re-infestation. The area must also be free from waste maize and lodging water.

5.3.2 Harvesting of Maize

The major constraint of the traditional crib is that it does not allow for optimal free ventilation and therefore the maize needs a long pre-harvest field during to safe moisture levels for storage. As a result of this long pre-harvest drying, the maize is exposed to the negative effects of wind, rain and to attacks of moulds, birds, rodents, termites and more especially insects. The insect infestation might not be noticeable immediately after harvest but the build-up will accelerate later during the normally high storage periods leading to high losses. The use of improved crib eliminates th

is long pre-harvest drying by harvesting the maize soon after it is matured i.e. with a moisture content of 28 % (wet basis). This early harvest also allows for an early preparation of the fields for the next crops.

5.3.3 Dehusking of Maize

The cobs should be dehusked before filling the crib in order to obtain the maximum drying performance and control of mould infestation. Highly mouldy or insect infested cobs are rejected or dried separately.

5.3.4 Shelling of Maize

After about 60 days or 8 weeks of drying under the Winneba District climatic conditions, the maize is shelled. If the maize is well protected against rain and the drying rate is reasonably fast, the moisture content of the maize should be between 13 -15 %. During shelling, heavy mould and insect infested grains are rejected and the grain is admixed with an insecticide such as Actellic 25 EC, in the recommended before bagging.

5.3.5 Storing of Bagged Grains

The inner walls of the crib are covered with thatch straw or any suitable materials to protect it from the weather. The maize is stored in the crib and inspected occasionally for any mould infection and the dried or retreated with the insecticide.

It is evident from the description of the improved crib that it is not too different from the traditional one. As a result one would have expected that there would not have been problem with its adoption by the small-scale farmer as an appropriate technology to reduce post-harvest losses. Unfortunately, the FRI Maize Storage Group observed a number of

problems and factors that appear to inhibit its general adoption. The factors are many but can be discussed under the following sub-headings.

5.4 Technical Problems

Three types of the improved crib have been identified with respect to the materials used for their construction.

TYPE I: Where the crib is constructed from locally available materials on the farm, e.g. sticks, thatch etc. and the farmer pays nothing or very little for its construction.

This needs maintenance at least once in 3 months.

TYPE II: This type is made from locally available material which the farmer has to pay for because he does not grow or have the materials around him, e.g. bamboo, thatch etc. This type needs maintenance at least once in a year.

TYPE III: This mainly different from the previous ones because in addition to the locally available materials he uses some of the manufactured items such as sawn timber, corrugated roofing sheets, nails, wire mesh, solignum etc. This type is very durable as it has very little maintenance cost, but requires relatively high initial investment. It also needs some amount of craftsmanship in its construction.

In some of the rural areas, if one needs to construct Type III, the problems one may come across would be:

i. Unavailability of roofing sheets

ii. Unavailability of metals sheets for rat-guards.

iii. Unavailability of bamboo.

Another technical problem is in the use of insecticides:

i. Unavailability of insecticides in the rural areas.

ii. High relative costs of insecticides.

iii. No convenient package size for the scale farmers who cannot afford to buy the whole can of technical or concentrated solution.

iv. Lack of good extension campaign to teach farmers recommended usage of insecticides. For example at Oguakrom, a maize-farming village off the Winneba -Agona Swedru road, some maize farmers became sceptical about the use of Actellic 25 EC because one farmer unfortunate dipped whole cobs into the diluted solution instead of just the tips of the cobs. This is resulted in high mould growth of his produce.

5.5 Socio-cultural Problems

i. Acceptance of the crib in the first place since some farmers claim it is quite similar to the traditional one and can not hold large quantity of the produce. Most fail to appreciate the critical points such as:

- its small width
- cribs facing prevailing wind
- adequate wall openings for good drying performance
- presence of rat-guards

ii. Some of the farmers accept the losses they incur as a result of using the traditional crib as normal and therefore do see the need to reduce this through the adoption of an improved crib.

iii. Some farmers who even adopted the improved crib later became reluctant to follow the recommended methods of using the improved crib. These include early harvesting, dehusking of maize, drying to safe moisture levels (13 - 15%) before shelling, treatment with insecticides and bagging. It is very important to note that farmers in the district do not dehusk the maize before storing them in their cribs. This they claim protects their maize from further attacks of the insect pests.

iv. This habit of the long pre-harvest drying on the field is changing due to the introduction of high-yielding varieties which are more susceptible to pre-harvest infestation than the local of traditional varieties. The new varieties are prune to infestation because of poor husk cover at the tip. Therefore using the improved crib in the recommended way would go well with the cultivation of the high yielding varieties. Some farmers still prefer growing the traditional varieties and this is another factor why the adoption of the improved crib has been slow.

v. Reluctance of farmers to adopt the improved crib because the traditional crib serves the dual purpose of a crib and a kitchen. The kitchen is constructed under the crib. The kitchen fire dries the maize and the smoke dries away the insects.

vi. Some farmers feel reluctant to treat their maize because they erroneously believe the insecticides are poisonous.

5.6 Socio-economic problems

One of the basic requirements of using the improved crib is that it must be placed in the direction of a prevailing wind. This basic requirement became a point of disagreement for most of the farmers during the work of the FRI Maize Storage Team in the Winneba District. Most farmers preferred to have the crib positioned very close to their low-windy compound homes. Most farmers argued that if the crib is placed out sight it will be very easy for thieves to steal their produce. This will be a disastrous effect since most of them considered their stored produce securities for loans from banks and co-operatives.

5.7 Recommendations

Adoption of the improved crib is very slow in the areas the FRI Maize Storage Group has been working. This is because of the initial costs involved if a farmer is constructing a durable crib.

The FRI Maize Storage Group recommends that Co-operatives, Agricultural Extension Officers, Schools Community Farms should adopt the crib and use it as demonstration unit for the communities in they live.

There is the need for more education and extension work on the advantages and the use of the crib to farmers. This can be through demonstration and local workshops.

There is also the need for education and extension work on good storage practices such as storage hygiene.

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