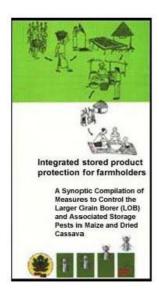
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Integrated stored product protection for farmholders

A Synoptic Compilation of Measures to Control the Larger Grain Borer (LOB) and Associated Storage Pests in Maize and Dried Cassava

Elaborated

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by

GTZ/Tanzania Project. for Integrated Control of Storage Pests

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Dar es Salaam

and

Deutsche Gesellschaft fur Technische Zusammenarbeit

(GTZ) GmbH

Project integrated control of the Larger grain borer in farmers' post-harvest systems"

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Co-operation and Development (BMZ)

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Preface

From the economic point of view and in terms of protection of the natural resources, it is much more reasonable to protect harvested produce against loss than to invest in further increases of the agricultural production. According to investigations made by GTZ 5 to 30 % of the African maize and cassava harvest is destroyed after six to eight months of storage by stored product pests. The losses depend on the storage s ystem and the presence of the Larger Grain Borer (LGB), which is particularly devastating. According to FAO statistics the overall production of maize in Africa is 36 million t per year. Tak ing into account that three quarters of the total harvest are stored at farm level, the minimum losses amount to 1.35 million t every year. Much of these losses can be prevented using integrated post-harvest protection measures.

Integrated post-harvest protection on the farm level means the selection of appropriate measures according to the specific situation on every single farm. Integrated post-harvest loss prevention combines profitability with the protection of the natural resources. There are various possibilities to reduce or completely avoid the use of chemical stored product protectants. It is the task of the farmers and the extensionists to analyse the needs carefully before choosing the measures that suit them best. Criteria like simplicity, availability, cost, labour expense must always be taken into account. In this context, the extension brochure is intended to contribute to post-harvest loss reduction and to the improvement of food securit y.

However, there is a high demand for ready-made Integrated post-harvest packages which can be transmitted to the farmers in a Top-down approach. Such approaches will invariably fail, because

they do not take into account the socio-cultural and economic conditions which They free releases that cannot cover all these conditions. Instead, it gives an overview of commonly practiced methods and measures to control the LOB and other stored product pests including the prevention of mould development. Methods which do not include the use of synthetic insecticides are particularly recommended in this leaflet.

Improved post-harvest protection allows the farmers to profit from the annual fluctuations of the mark et prizes by s elling quality products at the time when the prizes are high. By this the farmers can considerably increase their incomes, because the price fluctuations are often much more important than the monetary value of post-harvest losses.

The contents of the leaflet are presented in a matrix which provides a quick access to the relevant information. The single elements included must be combined by the users of the leaflet in order to form integrated stored product protection schemes that meet the above mentioned requirements.

The leaflet is primarily directed to extension workers and subject matter specialists who are the main transmitters of agricultural innovations. The methods and measures listed below may concern different target groups. Therefore, the target groups are indicated in the matrix using the following abbreviations:

DM Decis ion makers
FA Farmers
SM Store managers
AP Applicators of insecticides to protect stored products (commercial and private)
WO Women in rural households

The numbers indicated in the column "Info" refer to the publications listed under "Further information at the end of this leaflet.

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Further information

Special extension leaflets and brochures on some of the measures listed in this matrix have been published by this and other post-harvest projects of GTZ. They are listed below under the numbers appearing in the column "Info" of the matrix. These publications can be ordered free of charge from the adresses given in the preface of this leaflet. The languages in which they are available are indicated in brack ets.

- 1 Traditional Means and Methods of Stored Product Protection (english/french)
- 2 Plant-derived Products as Protectants against the Larger Grain Borer (*Prostephanus truncates*) and other Stored-food Pests (english/french)
- 3 Protecting stored maize cobs against pests by the use of non chemical products english/french)
- 4 The Pest from Afar (english/french/german)
- 5 News from the Larger Grain Borer (english/french)
- 6 Recommendations on the Use of Teretriosoma nigrescens for the Biological Control of

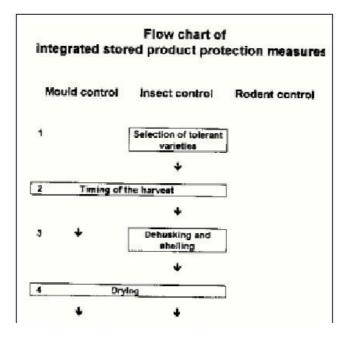
Prostephanus truncates (english/french)

7 The Use of Teretriosoma nigrescens for the Integrated Control of the Larger Grain Borer (Prostephanus truncates) (english/french)

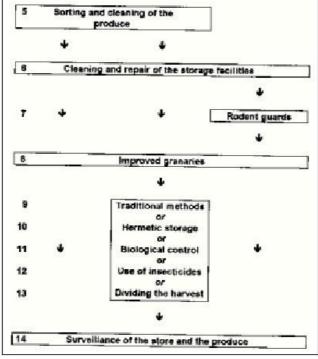
- 8 Getting it Right: Integrated approach for Short and Long Term Post harvest Protection english/french
- 9 Recommendations for the Choice of Insecticides to Protect Stored Products in the Tropics (english/french)
- 10 Hifadhi bora ya mahindi ngazi ya kaya (kisuahili)
- 11 Manual on the Prevention of Post-harvest Grain Losses (english/french/arabic/portuguese)

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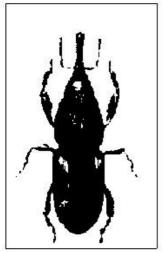


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Flow chart of integrated stored product protection measures

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Sitophilus zearkmaize weevil)

The integrated stored-food protection package

It has proved to be the case that individual measures of stored-food protection the desired result, as storage constitutes merely one element of the complex

Fach strages to the subsequent stages in the simplest case fairling, the post-naivest system malze is characterised by the following (subsistence sowing - harvest - transport - drying - sorting - measures of traditional stored-food storege to helling - processing or consumption

The pack agentegrated measures to protect maize cobs against stored-food pests this leaflet, sets in at several of the above-mentioned stages of the s ystem, and following some bone in the several of the above-mentioned stages of the system.

Selection of varieties

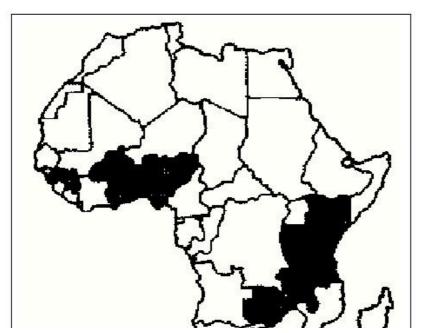
The storage properties of different varieties should already be taken into account cultivation. Local varieties with long husks tightly enclosing the cob are more storage than high-yielding varieties with short husks Stored product pests infesting style have very great difficulty penetrating the protecting enclosing leaves. The only exception to grain borer, which finds them no obstacle.

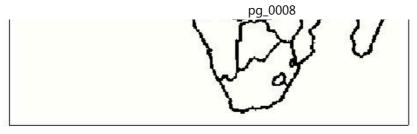
Harvest date

It is important to harmonise the framing calendar such that the required labour is best date for harvest. If the harvest is brought forward, there is a risk that the majs of the larger mm mouldy in the store. On the other hand, the longer "he maize start, the greater the risk that stored-food pests might already infest the crop in the field, and the maize in the

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African countries effected by the Larger Grain Borer





Source: Richard J. Hodges Proceeding of the 6th International Working Stored-product Protection Canberra, 1994; up-date Albert Bell, October 1996