

Decision support trees to find appropriate storage options for small-holder farmers in northern Ghana

Prepared by the Coalition partners of 'Farm storage project: Improving household food security by widening the access of smallholder farmers to appropriate grain store pest management'

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Introducing decision support trees

These decision support trees are designed to help Agricultural Extension Agents (AEAs) advise farmers on appropriate methods of storing maize, cowpea or sorghum grain. Decision trees are used to guide the questions used by AEAs so that an appropriate technical option is selected for the farmer. The decision support trees refer to Technical Boxes holding detailed information that should be explored with farmers. Once a specific technical option has been selected then further advice can be obtained from separate extension leaflets. The following leaflets are available –

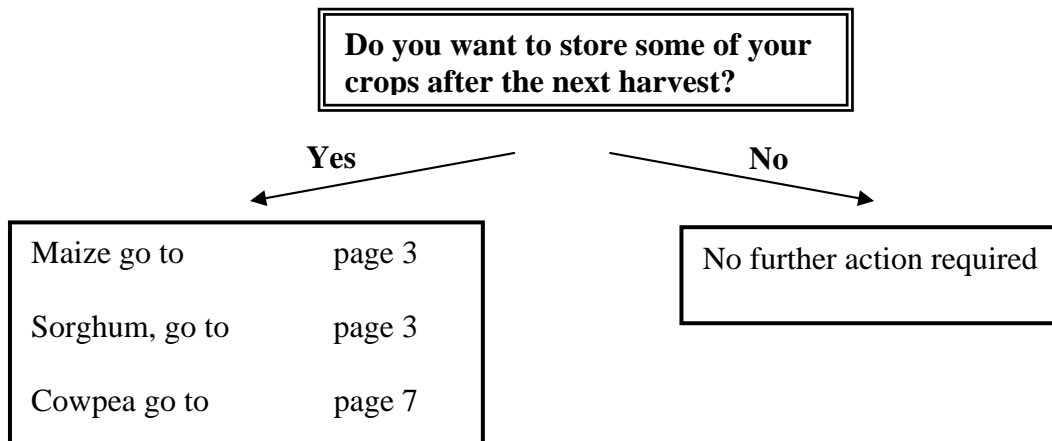
- No. 1 – Store types
- No. 2 – Preparing your store for the new harvest
- No. 3 – Putting the crop into store
- No. 4 – Keeping your store and crop in good condition
- No. 5 - Mud silos
- No. 6 – Insecticide treatment of all shell grain or cowpea to be place in store
- No. 7 - Insecticide treatment of only one third of shell grain to be place in store
- No. 8 – Botanical treatment
- No. 9 – Cowpea solarisation

When considering maize and sorghum there are separate decision trees to select a store type and then choose an appropriate treatment. In the case of cowpea, the store type and treatment selection are dealt with in a single tree as the treatment recommendation is influenced by the type of storage.

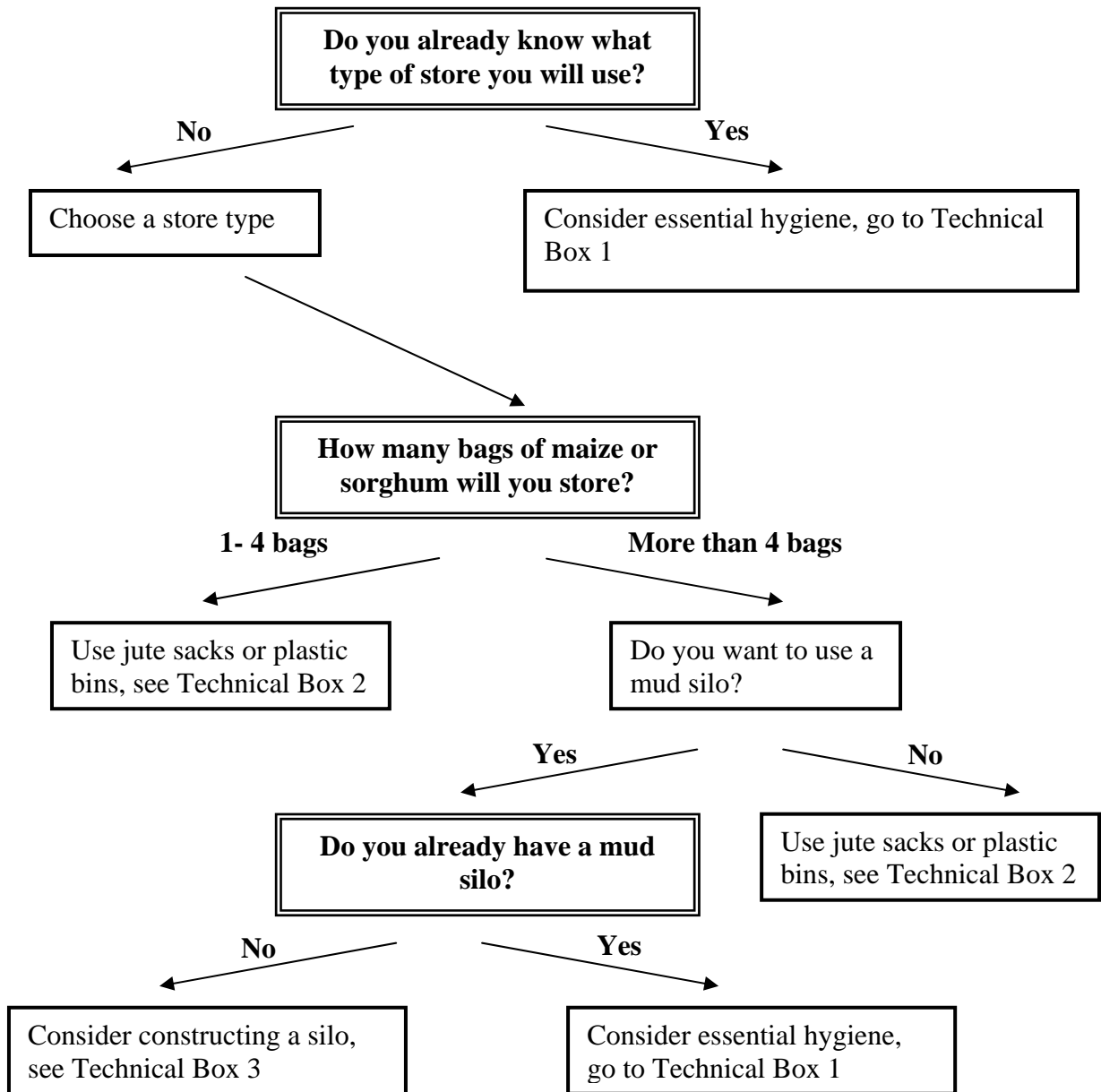
How this leaflet should be used

AEAs should meet with farmers at least one month before the start of the new storage season to discuss what storage options to adopt. It is not intended that AEAs should work through the decision trees question by question. AEAs will have been trained in the use of the decision trees so the sequence of questions will be well known and committed to memory. In this way the decision trees can be used as a guide to the interaction between AEA and farmer rather than as inflexible routines. Nevertheless, it would be expected that AEAs should have this leaflet to hand for reference to the Technical Boxes.

Will the farmer store some of this year's harvest ?



Choosing an appropriate type of store for shelled maize or sorghum grain



Technical Box 1 - Essential hygiene and store maintenance

The following measures are essential for all farmers storing crops.

1. Prepare the store

a. Make sure that all last season's grain has been removed before putting the new harvest in store. **Never** put the new harvest on top of the old.

b. Once the store is empty, clean it as thoroughly as possible to remove any insects. If using jute sacks these could be dipped in hot water and then laid out to dry or just laid in the sun shine for several hours. If using mud silos then the inner surface could be lined with cow dung to fill in any cracks where insects may be hiding. Alternatively, some dry leaves and twigs could be burnt in a silo to smoke out the pests.

c. Make any repairs to the structure of the store, including the roof, that may be needed to prevent access by pests and rain. In the case of a mud silos it is essential that the lid/roof fits well.

2. Prepare the new harvest

a. Harvest as soon as the crop is mature, don't delay. Leaving the mature crop in the field encourages insect infestation.

b. Make sure that the crop is thoroughly dry before shelling.

c. Separate out any insect infested maize cob and feed them to goats or chickens - do not keep in store. Mould infected cobs should be burnt (not fed to animals) since these cobs can be dangerous to the health of people and other animals.

d. Only dry, uninfested shelled grain should be put in store.

3. Keep you store and crops in good condition

a. Check the store structure regularly and repair it if necessary

b. If the grain becomes infested then consume or sell it soon. If you don't do this and you plan to keep the grain for more than six weeks you will need to treat it with insecticide (see leaflets 6 and 7)

c. Check the store structure regularly and repair it if necessary

e. Never put infested commodity near the store

If appropriate provide farmer with Extension leaflet No. 2, 3 and 4.

To consider if any treatment should be applied to the grain go to page 6 for maize or page 7 for sorghum.

Technical Box 2 - Advice for storing in jute bags or plastic bins

Jute bags should not be torn and should be thoroughly cleaned before putting grain in them. Do this by washing and drying in the sun. Jute bags cost about Cedi 6,000 each. (see Extension leaflet No. 1)

Plastic bins, that can be sealed tightly, are good storage containers. Most are about 100 kg capacity. Use the bins for the grain that will be kept for the longest period. Do not put new harvest on top of old harvest. These bins cost about xxx each. (see Extension leaflet No. 1)

To consider if any treatment should be applied to the grain go to page 6 for maize or page 7 for sorghum.

Technical Box 3 - Issues to address in advising farmers on the construction of a mud silo

You will need to establish all the following issues with the farmer before proceeding with the construction of a mud silo.

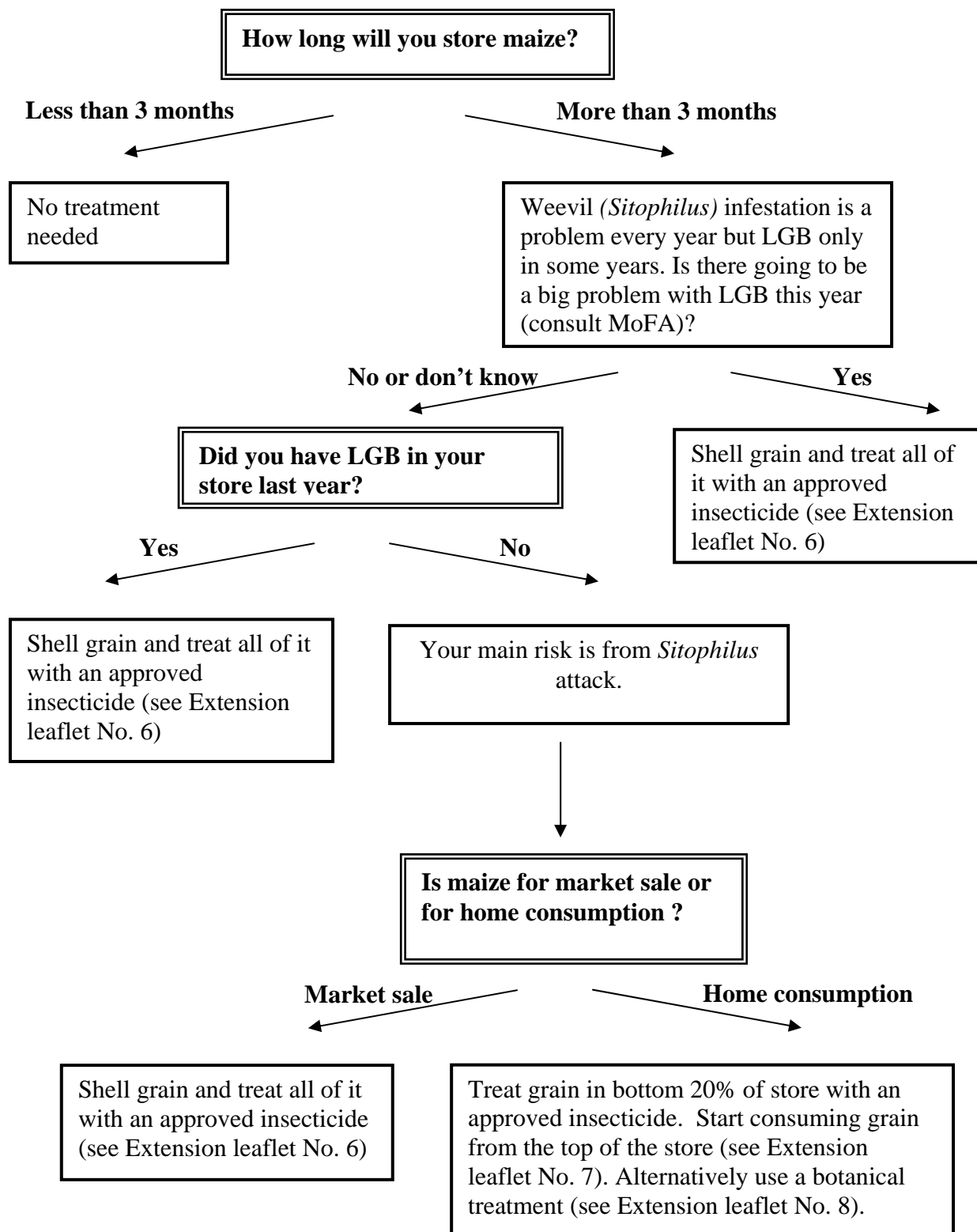
- a. Are skills for mud silo building available locally or could someone from outside the community be hired to build the silo?
- b. Are the materials needed for mud silo construction available locally? (correct sort of mud, sliming agent, rocks for silos base)
- c. Can you afford the costs of a mud silos (estimated at Cedi 240,000)?
- d. After completing construction of a mud silos, a period of about three months is required for it to dry before your produce can be stored. Is there sufficient time before the start of the next storage season ?
- e. Is there a secure site for the silo with sufficient space for construction?
- f. How will the silo be protected from domestic animals and the wind and rain?

If the issues addressed in this box can not be addressed satisfactorily then it would not be appropriate for the farmer to construct a mud silo. Instead farmers should use jute sacks or plastic bins (see Box 1).

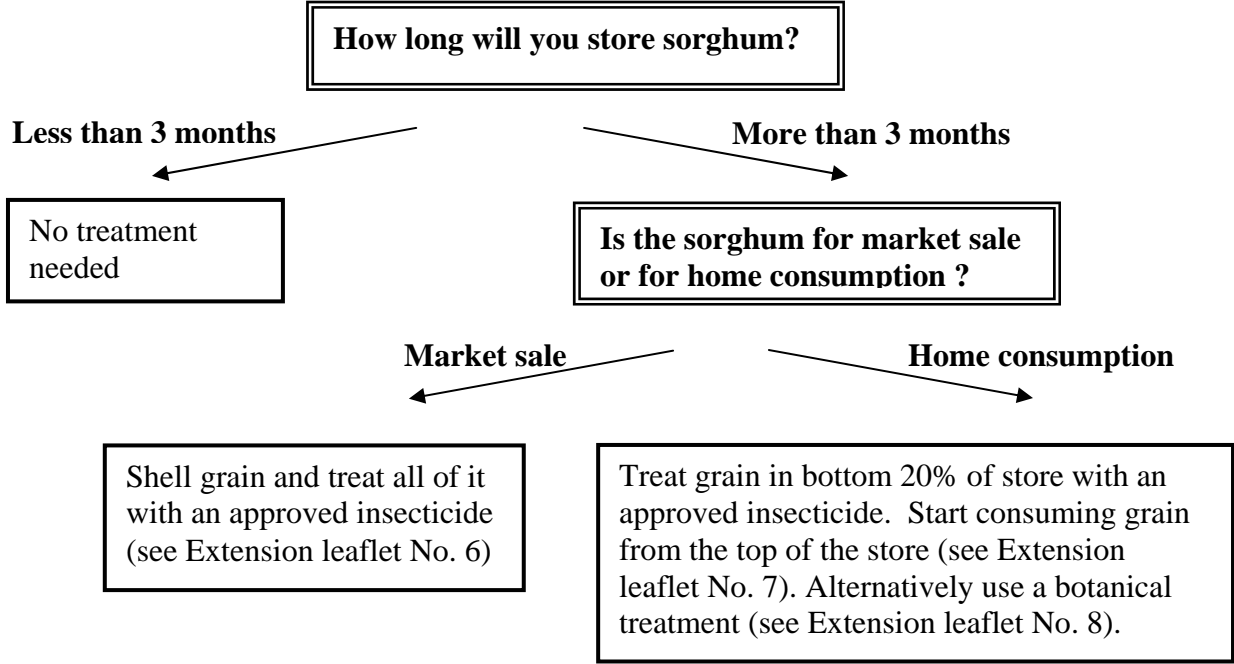
If appropriate provide the farmer with a copy of Extension leaflet no. 5.

To consider if any treatment should be applied to the grain in the silo go to page 6 for maize or page 7 for sorghum.

Choosing an appropriate treatment for shelled maize grain



Choosing an appropriate treatment for sorghum grain



Storing and treating cowpea

