

**TRAINING FOR FIELD STAFF ON GRAIN MANAGEMENT OPTIONS
AND THE USE OF THE FARMER DECISION SUPPORT TREE**

(PROJECT R8265/ZB0335)

Project Activity 2

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Objectives of field staff training

The Crop Post Harvest Programme (R8265/ZB0335) is focusing on improving household food security by widening the access of small-holder farmers to appropriate grain store pest management techniques. The main agents for the transmission of project outputs and recommendations are the field technical staff and they need to have a sound technical knowledge of some the messages to be imparted. They also need to understand farmer practices and ideas about the crops he/she is storing. To this end training was given to field technical staff from Ministry of Agriculture and Non-governmental organisations involved in the project.

The main objectives of this training are to;

- i. Give instruction in different storage options which are to be promoted,
- ii. Teach field staff how to collect relevant data from participating farmers, so as to facilitate easy project monitoring,
- iii. Find out ways of making farmer voices and opinions paramount in the project management and
- iv. Incorporate farmer activities in the development of farmer decision making process.

Topics treated by the field staff

Grain storage techniques which were developed by an earlier DFID Crop Post Harvest Programme projects were learned by the field staff. The main storage options (refer to Appendix 1) treated were

- Good farm storage techniques
- Insecticide treatment of grains and cereals
- Plant materials used in grain protection
- Solarisation
- Decision support tree for maize and cowpea
- LGB trapping

Field visit

Demonstration of solarisation and setting of larger grain borer (LGB) traps were done in Tampe-Kukuo, a village of about 5 kilometres outside Tamale. This allowed for farmer contributions especially their views about insect infestation, crop storage and control techniques.

Duration of training and attendance

The field workers training workshop took 3 days (25 – 27th March 2003) and was attended by 18 participants (refer to Appendix 2). The field staffs were from Ministry of Food and Agriculture (in Yendi, Gusheigu-Karaga, Savulegu-Nanton and Saboba-Cherponi districts) and non-governmental organisations (CARD, CAPSARD and OIC). The first two days were used for classroom teaching and learning and the third day was devoted to practical work of some of the technologies learned in a nearby village.

Appendix 1: Guideline notes for field staff

1. Good Storage Practice

- Crop is in good storage condition
- Store is in perfect condition
- Good storage hygiene
- Crop and store remain in good condition

Crop is in good condition

- Timely harvest to reduce field infestation
- Select good quality grain or cob for storage
- Clean grain by sieving or winnowing
- Dry the grain well to avoid moulds
- Sun-dry to get rid of insects in the grain
- If insects are present, treat grain with an approved insecticide

Keeping store in good condition

- A good store should keep the grain cool and dry
- Protect it from rodents, birds, farm animals and thieves
- Build the store away from branches of trees
- Fix rat guards to the legs of the grain store
- Keep the grain store clean

Good storage hygiene

- Don't put host food materials on the same platform
- Never put infested commodity near store
- Have access to stored commodity for easy inspection
- Dip the bags in boiling water to kill any insects
- Do not mix new grain with old

- Destroy infested storage woods by burning
- Changing infested store wood to avoid carry-over infestation
- Smoking LGB-infested platform
- Using lindane (Gammalin) or used engine oil to treat store woods

Crop and the store in good condition

- If insect infestation in the stored grain is expected, treat grain with insecticide
- Inspect store regularly for signs of pest attack
- Shell infested cob maize and treat with insecticide
- If maize cobs become mouldy remove them and dry
- Repair store quickly if it becomes damaged

2. Insecticide treatment

- Inappropriate insecticides: DDT, Gammalin 20, cotton and cocoa chemicals
- Recommended insecticides: Actellic Super, Sumicombi, Sofagrain
- Botanicals: Neem, pepper, woodash
- Fumigants: Phostoxin, Gastoxin

Actellic Super EC

- Consists of permethrin + pirimiphos methyl
- Recommended because it kills both weevils and Larger Grain Borer (LGB)
- (Sumicombi: fenitrothion + fenvalerate also effective)

Formulation of emulsion

- Loose maize grains: 5 ml **Act Super** to 200 ml **water** and applied to 100 kg of maize

(Crown cork **Act Super** / 1 milk tin of water and applied to maxi bag of maize)

- Dosage lower for husked cob maize

Application

- Put the formulation in hand sprayer
- Spread loose grains evenly on concrete floor/patio
- Spray grain with insecticide

Precautions

- Do not overdose or underdose
- Spraying should be thorough
- Treated maize should be dry before being put into sack
- Put maize sacks on platforms and not bare floor
- Leave space around wall and sacks for inspection and ventilation.
- Do not eat, drink or smoke while doing treatment
- Wash hands carefully before eating or drinking
- Do not allow insecticide to spill on body
- Wash clothes well after treatment

Targeted insecticide treatment

Insecticide applications in the **right concentration** in and around the storage crop to the **areas where the insects are present**, thus reducing worker exposure to insecticides and overall insecticide use

Approach to the use of insecticide is:

- less expensive

- better for the environment and human health, but
- still gives reasonable protection against storage pests

What to know about targeted treatment

- Treatment provide good protection but not as good as full treatment
- Bottom-only treatment compatible if farmers consume from the top
- Long-term storage may need top and bottom treatment
- Farmers with pre-harvest infestation and storing for long-periods need full treatment

3. Plant materials

Local name	Latin name	Methods of use cited by farmers
Neem	<i>Azadirachta indica</i>	seed oil, powder, paste or water extract, fresh or dried whole leaves, leaf powder, paste or water extract, admixed or layered
Lodel	<i>Chamaecrista kirkii</i>	powdered leaves, admixed or placed at base
Kuga	<i>Khaya senegalensis</i>	admixed powdered bark or leaves
Kpasiuk	<i>Ocimum americanum</i> var <i>ocimum</i>	whole or powdered mature plants, admixed or layered

Palaga	<i>Securidaca longipedunculata</i>	water from soaked roots, admixed powdered roots
Kimkim	<i>Synedrella nodiflora</i>	water from boiled leaves or whole plant, poured or immersed 20-30 sec., powdered leaves
Kulenka	unknown (Gramineae)	whole flower heads, mixed

4. Solarisation

- Using sun's energy to disinfest commodity of storage insects
- High temperature under plastic sheet kills insects

Solar disinfestation of cowpea is

- cheap
- environmentally safe
- effective
- no discolouration of grain

Solarisation trial in N. Ghana

- On station trials to test traditional and modern alternative methods
- Farmers tested 3 best methods 'on farm' over 3 months
- Monthly solar disinfestation
- Disinfestation at harvest and admixture of shea butter or of ash

Farmer evaluation

- Solarisation repeated monthly is good
- Time involved not a hindrance
- Good grains sold during lean season fetched 100% profit over price at harvest
- Only 15% of profit invested in materials for solarisation
- Good seeds for planting

5. Instructions for lgb flight traps at permanent trapping sites

i. Choosing a good permanent location for the trap

Two or four traps should normally be set in each village. Take time to look for good places to hang them. The traps should be hung at least 400 metres distant from each other and at least 30 metres from the nearest stored grain. Try to find a place where there is someone to keep eye on them. Each trap should be hung so that the breeze flows freely through it, at least 1.5 metres off the ground and on a tree or other sturdy structure.

Traps will be numbered 1, 2, 3, or 4 corresponding with each site. Before starting trapping, mark the yellow funnel of each trap in felt pen with

- a. its number and
- b. the name of the corresponding person who lives in the village, so that it can be easily returned in case it is taken by children.

ii. Setting the trap

Each trap consists of: a four-winged yellow funnel, a screw-topped plastic collecting jar, a filter paper impregnated with an insecticide (deltamethrin) solution to kill arriving insects, a plastic plate to protect the trap from heavy rain, and a long cord to hang it.

Place the filter paper inside the collecting jar and attach the bottom to the top. Unwrap one pheromone lure and place inside each trap where the wings of the funnel meet. Hang the plate over the wire at the top of the trap.

Using a cord, hang the trap up in the chosen site. Tell neighbours what it is and ask them to keep their children from pulling it down.

iii. Looking after the trap

It is not necessary to check the trap every day but if possible, check it after a big rainstorm to see that the trap hasn't blown down, that the lure is still there and the rain has drained out of the collecting jar. If the lure is lost, or the trap has fallen down, write down the date you think this happened, and take down the trap (see below). Then start trapping again at the next trapping date on your calendar.

iv. Taking down the trap

Leave the trap for a two week period. You will be given a list of dates on which traps should be refreshed.

Take the collecting jar off the trap. You will be given a set of labels with the location, date set and date collected for each trap. Fill these in fully and correctly. If you did not manage to change the trap on the set day, please give the actual date - it is important that we know how many days it was actually set for. Put the completed label inside the

collecting jar, screw the cap on and send to office, lab or home. Count the number of LGB and *Teretrius nigrescens* (Tn) separately for each trap.

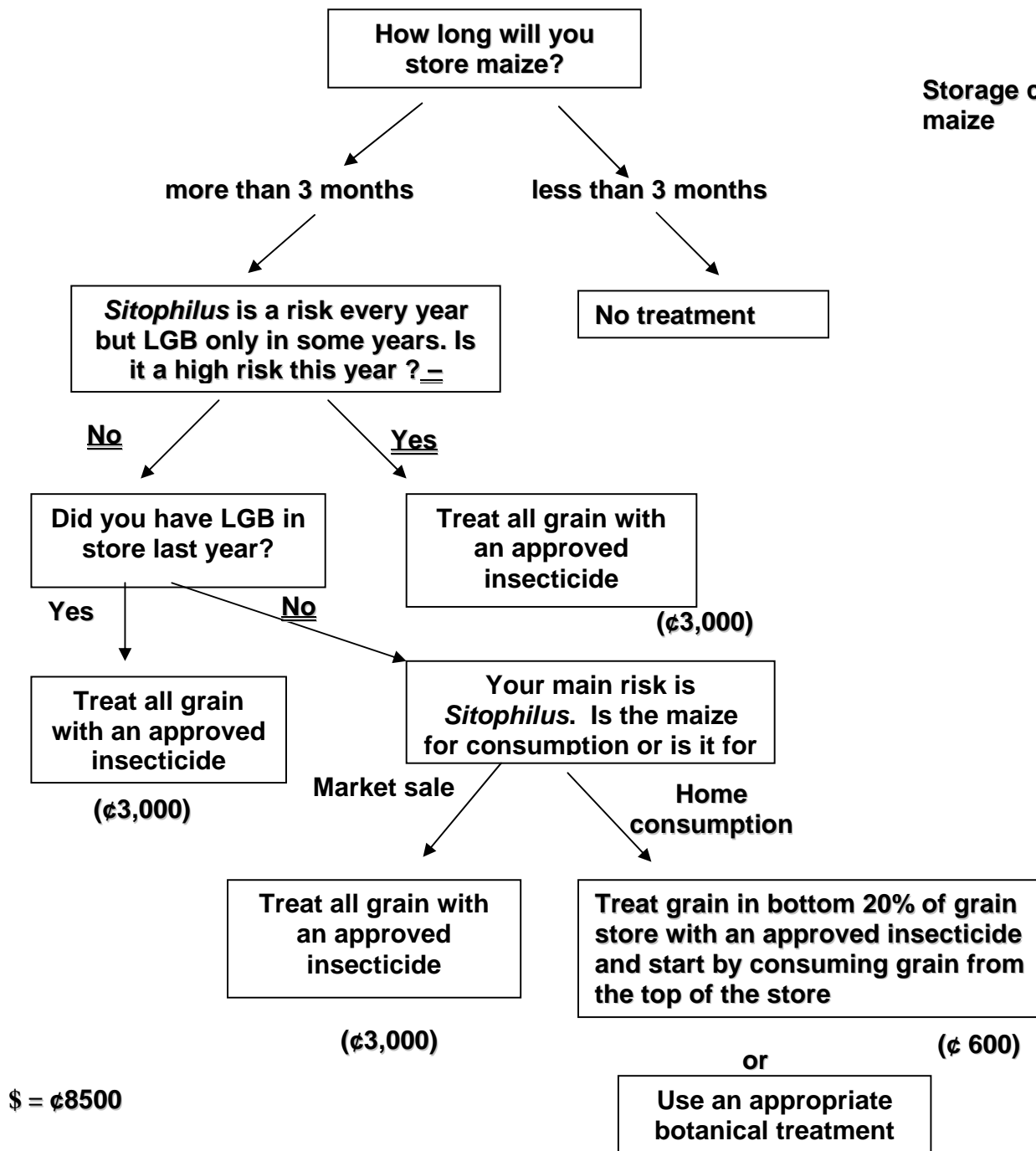
Replace the old pheromone lure with a fresh and screw the collecting jar with a new filter paper onto the bottom of the trap. (You can re-use the old filter paper a number of times if not destroyed by rain.) Immediately remove and burn or burry the old pheromone lure.

Appendix 2: Attendance list

S/No.	Name of participant	Address
1.	Mahama Dramani	Savelugu/Nanton (AEA)
2.	Tapoadam Joseph	CARD/Wapuli
3.	Akibu Hardi	Savelugu /Nanton (AEA)
4.	John Adams	CAPSARD / Savelugu
5.	Cosmos Nyar	Saboba/Chereponi (AEA)
6.	Julius Yirzagla	CARD, Tamale.
7.	Sulemana Stevenson	CAPSARD, Tamale
8.	I. H. Ayuba	OIC /Tamale (PCF)
9.	Alhassan Amadu	OIC /Tamale
10.	Dokurugu Salifu Ziba	OIC /Tamale
11.	Naresh Shukla	CARD
12.	Abukari Alhassan	Postharvest Technology Student, Tamale Polytechnic
13.	Mohammed A Ikililu	CAPSARD/ Savelugu
14.	E. T. Asare	Gushegu/Karaga (AEA)
15.	Fuseini Haruna A.	MoFA/ Tamale
16.	Joyce Bediako	UDS/ Nyankpala
17.	Samuel Addo	MoFA/ Tamale
18.	Samuel Arku-Kelly	OIC – Tamale

MAIZE

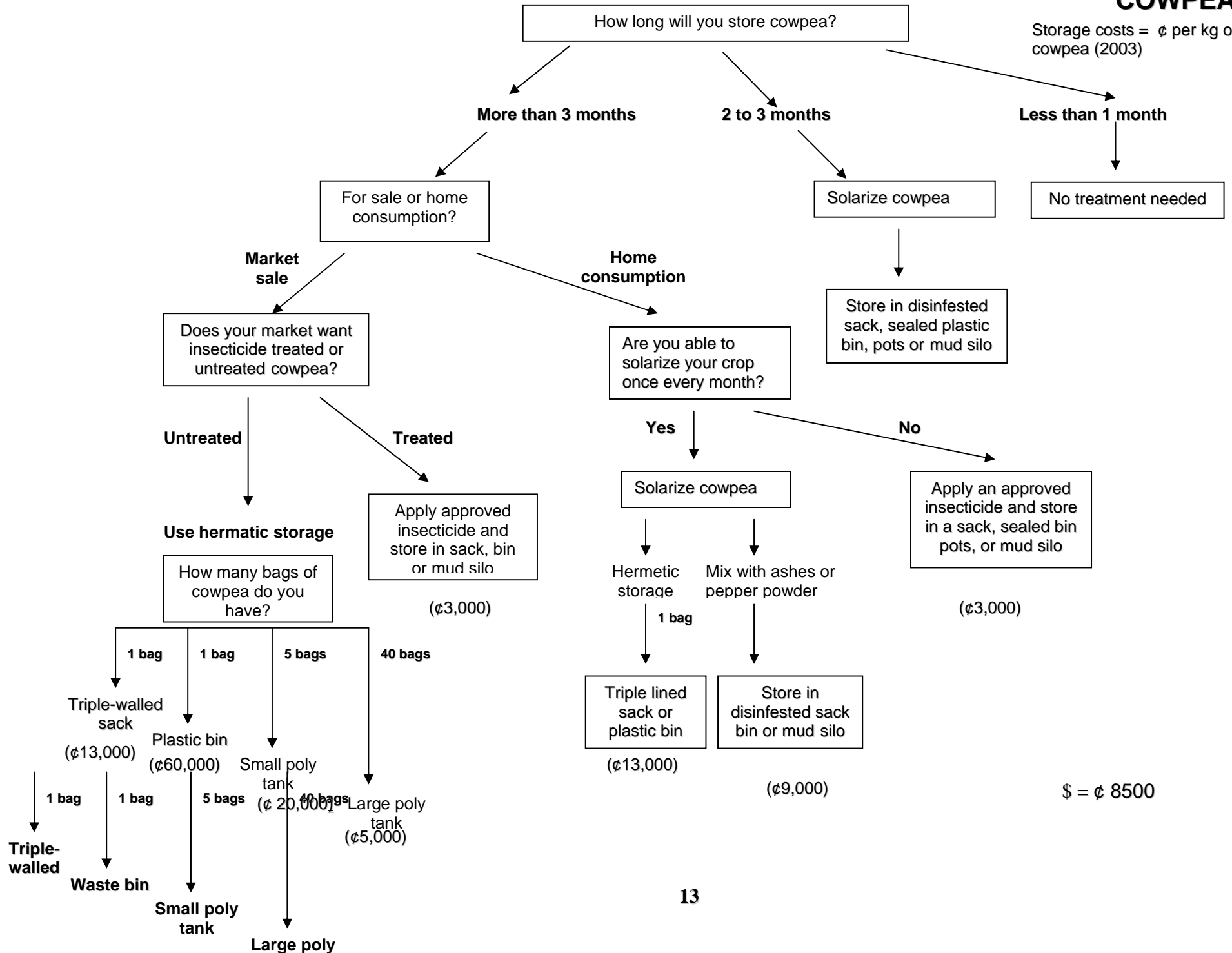
Storage costs = ¢ per kg of maize



\$ = ¢8500

COWPEA

Storage costs = ¢ per kg of cowpea (2003)



\$ = ¢ 8500