REDUCING POST HARVEST LOSSES ON COWPEA BY MONTHLY SOLARISATION AND MIXING WITH SHEAR BUTTER OIL

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Prepared and produced by "Matilong" under; Farmer Participation Development of Extension Materials: Improvement in the Storage of Cowpea Project Funded by DFID/NARO

INTRODUCTION

This pamphlet is prepared and produced by Matilong Youth Mixed farming organization for cowpea farmers wishing to preserve or store the seed till planting or time of scarcity. Farmers from Kumi and Katakwi Districts who participated in the trial project testing and validating some improved storage methods have validated the method, which is communicated here. DFID/NRI, NARO-SAARI and Matilong implemented this project.

There are three methods that were tested of which monthly solarisation and mixing with Shear Butter nut oil was found to be among the effective methods.

Point to note on Shear Nut Butter Oil Method.

Single solarisation and mixing with shear nut butter oil method requires that, you spread your cowpea under the sun once and you treat (mix) it with shear nut oil at the ratio of One litre to 100kgs of Cowpea and store until it is needed to be used up.

Collaboration in this project.

The effective collaborators in this project include:

KAP (Katakwi Action Project), KUDIFA, KADIFA, Vision Terudo, SAARI, NRI-UK, Extension Department Katakwi and Farmers.

"Eidare Lo Imare Lo Epatana Akoriok" Shear Nut Butter Oil Method.

Stage 1. Select an area free from tree shade and animals. Ensure that the area is swept clean.



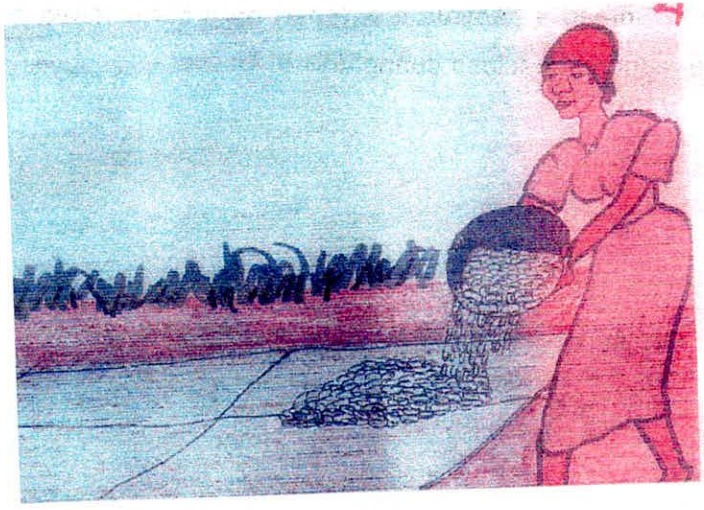
Stage 2. Spread a papyrus mat (epar) on a flat cleaned area, to ensure reduced heat loss during drying.



Stage 3. Spread polythene bags on the spread mat to make a flat smooth surface.



Stage 4. Pour the cowpeas on the spreadsheets.

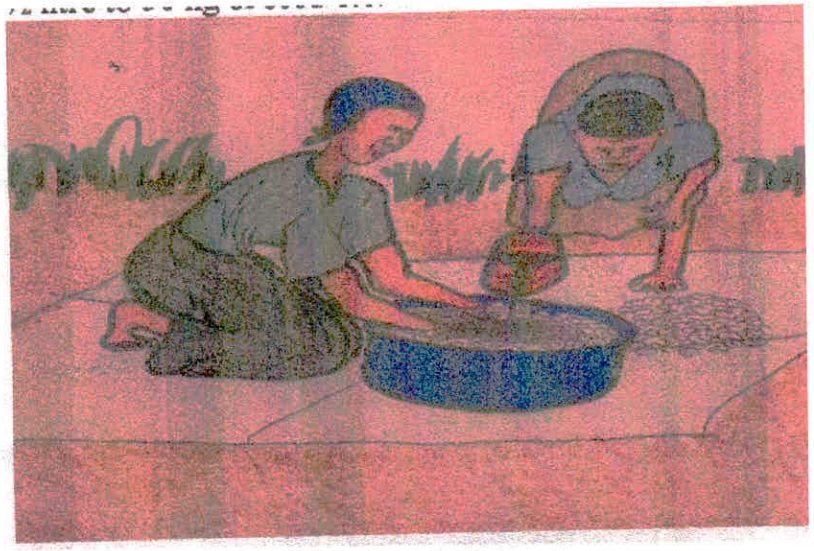


Big losses are incurred if the cow pea is left without any treatments. Farmers are advised not to leave their cowpea untreated during storage. This will lead into great insect pest infestation, damage and loss. Loss in quality will therefore lead to reduced incomes, poor quality food staff, poor seed for germination and miserable family livelihood, as cowpea is the major food source



Opalakiro and his family members above join together to cry on the losses of cowpea due to the insect infestation because of storing his crops without any treatment.

Stage 11 pour the shear nut oil on the cowpea and mix thoroughly at the rate of 1litre of oil to 100kg of the seed or ½ litre of oil to 50kg of seed etc.



Stage 12. Put the mixed Cowpea into disinfected containers e.g. polythene bags and store in a cool dry raised place.



Stage 5. Spread the cowpea on the spreadsheets to ensure uniform heating



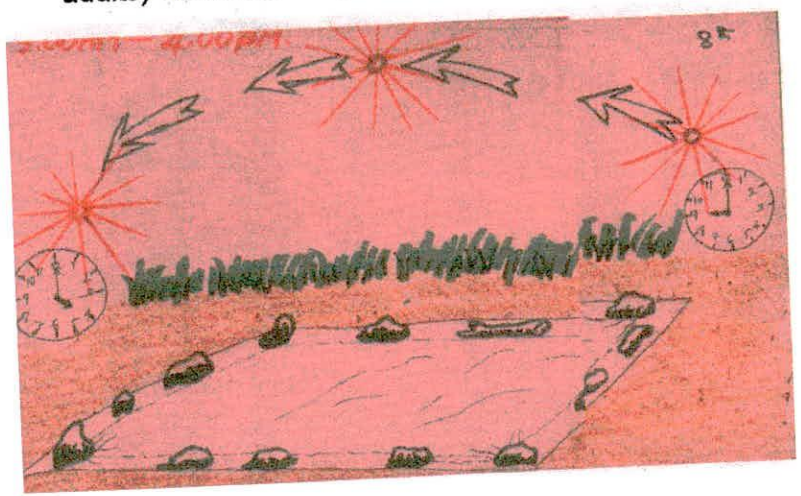
Stage 6: Make sure the depth of the cowpea is 2.5cm all around. This is done by using a finger as shown below.



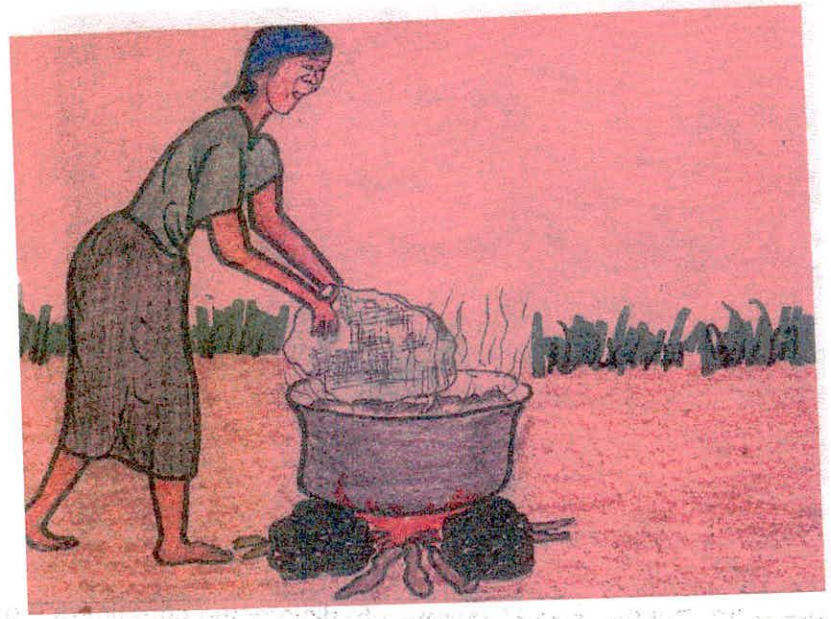
Stage 7, Cover the cowpea with polythene sheet and weight it down with stones to keep away air, moisture, dust and animals.



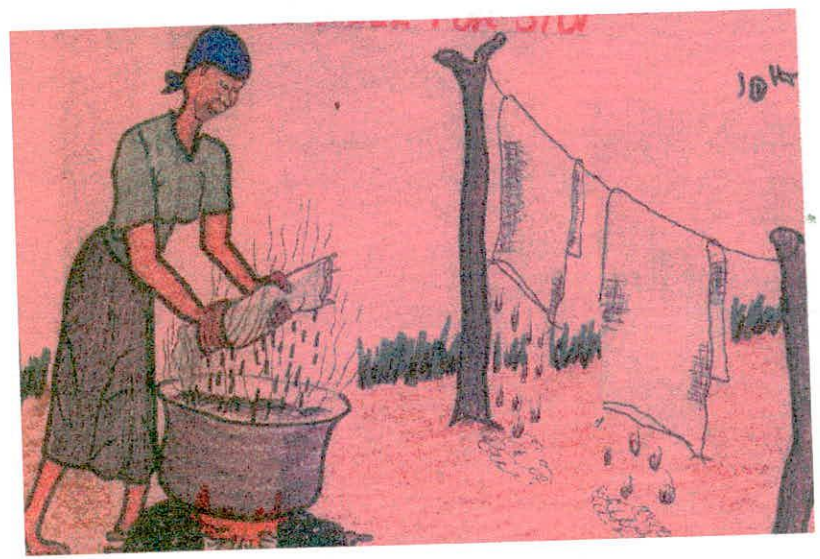
Stage 8. Leave the cowpea under the sunshine from 9:00a.m to 4:00pm to ensure that all stages of the pest (eggs, larva and adults) are dead.



Stage 9. Boil the storage materials in water to destroy the pests.



Storage 10: Rinse the storage materials and spread under the sun to dry.



Conclusions

Though this was the first participatory evaluation of crop technologies at Mbarara ARDC, it yielded some important information for both the region and the NARO core researchers especially the breeders. The results do emphasize the need to continue evaluation of crop technologies in multi-locations that are representative of the regions/food systems. Also, there was an evident need to seriously incorporate local varieties in breeding programs so as to tap those genes that are responsible for the acceptable traits.

Varieties that were selected should be multiplied further by Mbarara ARDC and distributed to farmers. This may call for joint efforts of the ARDC and its partners especially those operating at the grassroots.

The exercise was enjoyed and valued by all participants and it was recommended that the methodology be refined further for future use.

THE NATIONAL AGRICULTURAL RESEARCH ORGANISATION

MBARARA AGRICULTURAL RESEARCH AND DEVELOPMENT CENTRE

03 JUL 2004

PARTICIPATORY EVALUATION AND SELECTION OF CROP TECHNOLOGIES FOR THE SOUTHERN RANGELAND ZONE OF UGANDA



December, 2003

PARTICIPATORY EVALUATION OF CROP TECHNOLOGIES AT MBARARA ARDC

Introduction

Participatory tools have been used to evaluate and select various technologies. This methodology has proved to be very successful in the quick identification of farmer preferred technologies. Consequently, the technologies that have been identified through the participation of various stakeholders especially the end users have recorded a high adoption rate.

In Uganda, although some research Institutions have carried out participatory crop technology evaluation and selection, the highly varied food systems calls for application of these tools nearest to the grassroots. Accordingly, Mbarara ARDC initiated a stakeholder participatory evaluation of available crop technologies from the NARO core research institutes. In pursuance of this agenda, the ARDC has the following objectives in mind :

- Understand farmer crop production and utilisation practices/ constraints and advise NARO core research institutes to make necessary adjustments tailored to meet farmer needs.
- Conduct participatory trials and identify appropriate technologies for the mandate areas of Mbarara ARDC i.e. the Southern rangeland zone of Uganda
- Familiarise the area development partners with participatory tools for eventual application at the lowest grassroots.
- Strengthening of relationships between Mbarara ARDC and its clients.

Table 3: Preferences for crop varieties before and after cooked/roasted taste by stakeholders at Mbarara ARDC

Crop	Variety	Field ranking	Final ranking (after cooked taste)
Sweetpotato	NASPOT 1	4	5
	NASPOT 2	1	7
	NASPOT 3	3	3
	NASPOT 4	2	6
	NASPOT 5	9	8
	NASPOT 6	4	9
	TZ	3	2
	SPK 004	5	1
	Sowola	5	4
Groundnuts	3	1	3
	2	2	2
	1	3	4
	7	4	1
	4	5	6
	5	6	5
	6	7	6
	9	8	7
	8	9	7
Beans	NABE 7C	2	1
	SUG 32	1	2

Naspot 6	Not very thick vegetative material The vines look very attractive	Vegetative cover is light indicating that it may not be drought tolerant. The tubers deteriorate very quickly. Thick peel of tubers which is associated with thready tubers and low dry matter.
Sowola 6	Has very good stems. Tuber color is very good. Raw taste of tubers is good. Tubers have high dry matter content. Tuber shape is good for peeling	The leaves and vines look as if they are affected by viruses. It does not appear high yielding. Planting materials are not good
Variety Ranking	**Positive attributes**	**Negative attributes**
SPK 004	Has attractive vines. Looks high yielding. Inner color of tubers (yellow) is attractive. Planting material is not bulky so it is easy to transport	Light vegetative cover indicates that the variety may not withstand drought and related pests. Does not re-cover the ground quickly after piecemealing
TZ	Appears high yielding, Vines look attractive and cover the ground so that the tubers do not mould during the dry season. Produces plenty of vines for animal feed and planting material	Broken tubers produce little sap that indicates low dry matter. Tuber shape is not attractive. Has some viral infection.

Materials and Methods

Various crop varieties were planted and managed at Mbarara ARDC using recommended procedures. At maturity, selected farmers and extension staffs were invited to participate in the evaluation and selection of crop varieties of groundnuts, maize, beans, bananas, cassava, and sweet potatoes.

Planning meeting

Prior to the exercise, the staff of MBARARA ARDC held a planning meeting. The output of the meeting included:

- Possible types of participants for the exercise identified and these included extension staff, ARDC staff and farmers.
- A date for the exercise set
- Letters to lead extension staff requesting them to identify grassroots participants drafted and dispatched.
- An evaluation form to be used in the exercise designed
- An agreed upon procedure for the crop technology evaluation
- Materials to be used identified for purchase
- Roles and responsibilities for the set date allocated to staff

Thereafter relevant communications were made with the lead extension and the grassroots stakeholders were served with invitation letters.

Introduction of the participatory concept to the stakeholders

The invited stakeholders were received at the ARDC by the staff and were ushered to the training hall. An opening prayer was led by one of the farmers and this was followed by a self-introduction. The center manager gave some welcome remarks after which the team was introduced to the background and concept of participatory evaluation and selection of new technologies.

The exercise for the day was explained to the participants and the participants were divided into 3 groups. Each group was allocated a guide person from the ARDC and assigned crop technologies to evaluate. Each group identified a leader, who was to compile the findings of the group and communicate them later in a feed back workshop that was held after the exercise on the same day. The groups were later then to the field by their respective guides. In the field, the guides conducted a brief orientation to the participants before commencement of the evaluation exercise.

Evaluation and selection

In the field, clarifications on the procedure were made by the guides as need arose. The evaluation and selection was done at 3 levels as indicated below in Table 1. The participants were requested to make their assessment that included what they liked (positive attributes) and what they did not like (negative attribute) of each variety. Any other remarks made by the participants were recorded by the guides.

Samples of available crops were harvested and cooked or roasted the way it is done locally by the people so that the participants don't attribute any character to differences in processing techniques. The samples were labeled appropriately using codes and the true identities were only known to some staff of the ARDC. This was done in order to avoid biasing the evaluators who may have been familiar with some of the crop varieties. The identities of the varieties were revealed after the exercise to enable the group leaders compile their reports. After the exercise, the team held a feed back workshop during which the group leaders presented their findings.

Variety	Positive attributes	Negative attributes
Ranking		
Naspot 1	Retains vegetation for long Produces plenty of vegetative material for animals Good tuber size No diseases on the leaves Not attacked by weevils	Creeps too long Too much vegetation tends to indicate long maturity. White skin colour of the tubers is associated with poor taste Raw taste of the tubers not good
Naspot 2	Looks high yielding, looks impressive, good leaf color (red) that is associated with good taste, good tuber color, produces plenty of planting materials. Tuber produces plenty of sap when broken-an indicator of good cooking quality and mealyness. Looks drought tolerant	A bit more susceptible to leaf pests than NASPOT 1. Poor tuber shape (short and stout with irregular surface)
Naspot 3	Seems to be less susceptible to leaf pests than Naspot 2. Dark color of vines (dark purple) is attractive. Plenty of sap on broken tubers indicating good taste (better than Naspot 1)	White tuber color is not attractive. Tuber shape is not appealing. Does not look high yielding
Variety Ranking	**Positive attributes**	**Negative attributes**
Naspot 4	Tuber shape and size are good and attractive for peeling. Appears resistant to pests and diseases	Too vegetative which may have negative implications for yield. Very little sap from broken tubers an indicator of poor cooking qualities
Naspot 5	Has some red tint on the vines that is associated with high yields. Sap production indicates good taste/cooking quality	Produces poor planting materials. Tuber shape is poor

Results and discussion

During the evaluation the stakeholders used many criteria to select or reject a crop variety. What was most evident is the importance attached to yield in selecting a crop variety. Farmers used indicators to predict yield for example cracking of the soil for potatoes. Another criteria that seem very important to the stakeholders is taste and they used some predictive indicators like skin color and amount of sap in broken potatoes to select for taste. The importance of taste was also very evident by ranking of potatoes before and after cooked taste. Before the cooked taste the stakeholders ranked NASPOT 2 and NASPOT 4 as the first and second respectively while after the cooked taste SPK 004 and TZ were ranked the best varieties (see Table 2). Importance of taste was also detected when the stakeholders ranked cassava variety NASE 10 as their third best despite their complaint that it was too watery at the time. This was also evident for the beans when the order of preference changed after the cooked taste. The participants preferred SUG 32 to NABE 7C in the field while after the cooked taste they preferred NABE 7C to SUG 32 (Table 3). The participants ranked cassava varieties MH 97/2691, TME 204, NASE 10, TME 14 and NASE 12 in that order of preference. Their ranking focused mainly on taste but they did consider other characteristics like color of the cooked tubers and mealyness. The available cooked maize cobs were all equally acceptable to the participants. The FIA 25 banana was preferred to FIA 17 because of the color after cooking. FIA 25 had a color closer to the local cooking banana than FIA 17. However, the taste of the cooked bananas of the two varieties were ranked the same and the participants emphasised that feeding on the 2 FIA varieties could be a better alternative to maize. This indicates that in case there was scarcity of the local varieties farmers could go for the FIAs instead of the now available alternative of maize.

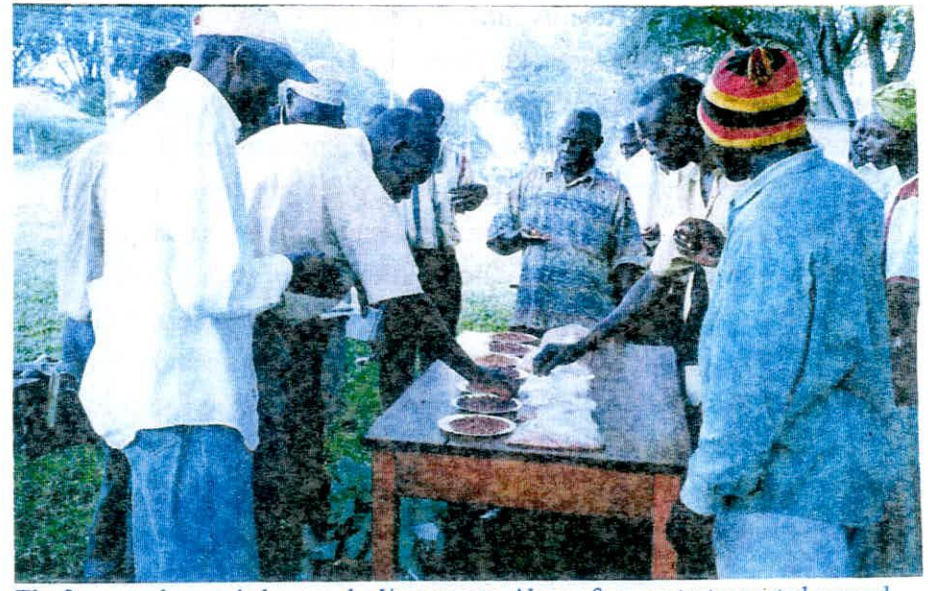
Table 1: Levels of participatory evaluation of crop technologies carried out at Mbarara Agricultural and research Development Center in December 2003

Crop	Pre-harvest (field)	Post-harvest (un-processed)	Post-harvest (processed)
Sweet potatoes	Done	Done	Cooked taste
Groundnuts	Done	Done	Roasted taste
Cassava	-	-	Cooked taste
Beans	Done	Done	Cooked taste
Maize	-	-	Cooked taste
Bananas	-	-	Cooked taste



Yield is an important selection criterion that farmers use. Above: Farmers compare the yields of 2 groundnut varieties. Below: A lady farmer insists on seeing the tuberous root yield of a sweet potato variety before selecting or rejecting it.





The farmers also carried out cooked/roast taste. Above: farmers taste roasted groundnut varieties while below they are tasting sweet potato, beans and cassava varieties. Taste and cooking quality are important criteria that determine farmer preference for crop varieties.

