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Bean Farmer Day at Lushoto



Northern and Southern Tanzania Bean Farmer Day Held at Lushoto, Tanga, Northern Tanzania

July 2002



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Farmer group activity reports for the DFID
Crop Protection Programme (CPP) Bean
IPM Promotion Project in eastern and
southern Africa.

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For distribution to Village Information
Centres (VICs) in bean growing areas in
eastern, central and southern Africa.

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Introduction

Bean day has been organised by CIAT, farmers and NARS at the end of each growing season since 2001 to facilitate cross village and cross location farmer visitations, sharing of experiences and exchange of information. The purpose/objective of such visits is to increase IPM awareness among participating and non-participating farmers as well as policy makers (Project output 3) and increase the availability of IPM technologies for bean pests at target sites (Project output 4).

The bean day was successfully conducted in Lushoto District on 11th July 2002. It was organised by farmers' groups from Ubiri, Nyasa, Mbuzii and Kwa Lei villages in collaboration with Lushoto District Council - District Agricultural and

Livestock Development Office (DALDO). The participants included farmers from three other districts, Mbeya Rural and Mbozi in southern highlands and Hai in the northern highlands (Kilimanjaro). The Arumeru farmer representative failed to turn up to join the groups. The total number of participating farmers from each location of the three regions and their respective extension officer representatives are shown in Table 1.

All discussions were held in each village with farmer representatives explaining in detail the problems being addressed, activities conducted, process followed and observations made. Each of these presentations was discussed, questions and suggestions/comments raised and responses generated by members of the respective host farmer groups. Conclusions and suggestions/recommendations for future activities were made and agreed on by all farmer groups.

Table 1. Location representation of participants of Lushoto Bean Day on 11th July 2002

Region	District	Village	Total number of farmers	Total number of extension officers
Tanga	Lushoto	Ubiri	13	1
Tanga	Lushoto	Nyasa	12	1
Tanga	Lushoto	Mbuzii	13	1
Tanga	Lushoto	Kwa Lei	13	1
Mbeya	Mbozi	Shilanga	1	-
Mbeya	Mbeya rural	Mbawi	1	-
Mbeya	Mbeya rural	Mwashoma	1	1
Mbeya	Mbeya rural	Inyala	1	-
Kilimanjaro	Hai	Magadini	4	1
Kilimanjaro	Hai	Mungushi	1	-
Kilimanjaro	Hai	Kwa Sadala	1	-
Kilimanjaro	Hai	Rundugai	1	-

Issues raised and discussed at each village:

1. Ubiri village

Ubiri farmers grow maize, beans, bananas and vegetables. Farmers observed that their crop yields have been declining gradually in recent years. The most important constraints to crop production at the village according to Ubiri farmers are infertile soil, field and storage pests of beans and vegetable field pests. The situation prompted farmers and their extension officers to study the problems and develop strategies for their management. Among the strategies that were tested and found to be effective are:

Soil fertility management

A representative of the farmer group explained the process followed in using available green manures for soil fertility amendment. In that village they tested and evaluated several local plant leaves and found *Vernonia myriantha*? (Tughutu in Kisambaa) and *Tithonia diversifolia* (Alizeti pori in Kisambaa and Kiswahili) as two of those that performed well.

Preparation process for *Vernonia* leaves: The process involves collecting one handful of the leaves (equivalent to 100 gm), chop them, place the amount in a planting hole and cover it with a thin layer of soil (2-3 cm). In the case of seeds, they are sown on the following day and seedlings are planted 3-4 days after manure application. Farmers had experimented with this on beans, maize and vegetables and compared it with NPK for several seasons. During evaluation farmers observed that the performance of chopped *Vernonia* leaves was comparable that of the commercial fertiliser. The farmers resolved to use the locally available and low cost green manure because they cannot afford to purchase enough quantities of the commercial fertiliser that may not be available on time. *Vernonia* and *Tithonia* are also used as medicines for human (malaria) and animal (worms and anaplasmosis) diseases. Most farmers grow these plants around

their fields and homesteads. These plants are also found in stream valleys and uncultivated portions of the predominantly hilly area in Lushoto. Chemical analysis (data from ARI Mlingano, Tanga) on the leaves from *Vernonia* and *Tithonia* showed that they contain small amounts of NPK (i.e. 3.6, 0.25, 4.7 and 3.2, 0.23, 4.4% respectively).



***Vernonia myriantha?* (Tughutu in Kisambaa) used as green manure for soil fertility amendment and field pest management**

Field and storage pest management

Another farmer representative explained to the visiting groups that they had experimented with improved bean varieties, cultural practices (sowing dates, timely weeding,) botanical pesticides, cow urine and green manure to manage insect pests and amend soils for beans and vegetables. The important bean pests include bean foliage beetle (*Ootheca* spp.) and bruchids (*Acanthoscelides* sp. and *Zabrotes* sp.). The commonly used botanicals are *Vernonia lasiopus* (Mhasha in Kisambaa and Muhasha in Kiswahili), *Tetradenia riparia* (Zaake in Kisambaa), *Tithonia diversifolia* (Alizeti pori in Kiswahili and Kisambaa) and *Pycnostachys umbrosa* (Donondo in Kisambaa). The farmer indicated that these materials are used because they are easily available to every farmer at no cost and have proven to work well. In 2002 bean growing season however, these farmers were obliged to use a commercial insecticide (Selecron) because *Ootheca* spp. population was too high at the

beginning of the season for the slow acting botanicals to reduce their population and damage on beans. Farmers continued using the botanicals after the peak population. Farmers rarely use commercial pesticides because of the high costs, unavailability and also because they are aware of the negative effects on their own health and the environment.

Preparation:

Botanicals: The farmer explained that one kg of the selected herb is pounded and soaked in 3 litres of water for 10 to 12 hours. The mixture is filtered and the filtrate mixed with 10 gm of powder soap and sprayed onto the beans and vegetables in the field. Spraying is carried out during dry and cool conditions (preferably in the evening or very early in the morning) to avoid loss of activity due to high temperatures and strong sunlight. Dry leaf powder from the same herbs (1 kg leaf in 100 kg beans or maize) and wood ash are used in bean bruchid/maize weevil control during storage.

Cow urine: This is a traditional technology imported from Hai bean farmers during the 2001 Bean Day at Hai District, Kilimanjaro region. It was experimented with in the 2002 growing season and found to work well. The urine is collected and fermented for 7 days. It is then mixed with water in the ratio of 1 urine to 2-6 portions of water. The mixture is sprinkled (using tree branches and twigs) on to the crops in the field taking the same precautions used for botanicals.

Questions (Q) from visiting farmers and responses (R) from Ubiri farmer group

Q Is there any reason for chopping the leaves?

R Yes, chopping increases decomposition rate

Q Why was planting done 10 days after application of fertiliser?

R To allow some decomposition on the chopped leaves so that the products from this process do not interfere with germination.

- Q** Under what conditions should the chopped leaves be applied to the soil?
- R** When there is enough soil moisture that will enhance decomposition.
- Q** Why did you add some soap powder in the solution extracted from the botanicals?
- R** Because soap has three roles, it acts as sticking material, it is a dispersing agent and also it has an insecticidal effect.
- Q** Why do you soak leaves in water for 8 to 10 hours?
- R** This allows chemical substances to dissolve into the solution.



Ubiri ward administrative official/farmer group member explaining bean IPM activities to participants

2. Nyasa Village

The farmers at Nyasa village share similar problems with Ubiri village. One farmer representative indicated that the Nyasa farmer group used similar approaches to address such problems. Nyasa village have an additional pest problem, i.e. bean stem maggots (BSM) which is endemic in the location due to warmer and drier conditions compared to Ubiri. Farmers screened bean germplasm for resistance to BSM and the bean genotypes that showed promising results are XL52 and G21153.

An important question was put forward at this village

Q Do you plant crops other than beans?

R No

Advice/recommendation: The farmers were advised by all the other farmer groups to plant other crops like vegetables and fruits, and where possible keep some livestock. These activities will enable them intensify their cropping system, conserve soils and raise their income.



Women and Men Farmer Groups entertaining participants at Nyasa village

3. Kwa Lei village

According to one of the village group representatives, the most important constraints to crop production at this village are insect pests, diseases and infertile soil. The farmers used integrated management strategies to manage these problems.

a. Insect Pest Management: The most important insect pests at this village were *Oothenca* spp., aphids, bruchids in beans, white flies and aphids in tomato and cabbage, respectively.

Kwa Lei farmers have adopted the use of botanical pesticides more than commercial pesticides because the farmers have less negative effects to man and his environment.

The botanicals are easily available and the plants can be established by farmers. The most commonly used botanicals include *Vernonia* sp., *Tetradenia* sp., *Tithonia* sp. and *Pycnostachys* sp.



Kwa Lei farmer group delivering an integrated pest management message to participants through drama

Control of *Ootheca*, aphids, white flies and diseases in the field

Preparation: Farmers soak about 1 kg of pounded botanical leaves in three litres of water for 8 to 10 hours. The extract is mixed with 10g of powder soap and 4 crushed chillies. This concoction was applied to crops in the field for the control of *Ootheca*, aphids and white flies on beans, tomato and cabbage. The farmers also use some extract from Euphorbia trees (Muu in Kisambaa, Mwasa/Maasa in Kichagga, Mwasi in Kipare; Mnyaa in Kiswahili) to control cutworms at seedling stage. In addition, a mixture of fresh milk, a filtrate of ashes + water and water (at 0.25:1:3 ratio), a technology imported from Central Kenya has also been experimented with to control tomato leaf diseases.

Control of bruchids

Another farmer from the group explained the methodology followed in storage pest management. First the crop is harvested on time to minimise field infestation and theft. The beans are dried, threshed, and further dried in the sun before storage in bags or other containers.

Process: Farmers pick about 1-2 kg of dried leaves of one of the above botanicals. The dried leaves are crushed into a powder that is thoroughly mixed with 100 kg of dried beans and stored. Farmers also use chillies where, 200 gm of dried chillies are crushed and mixed with 100 kg of beans before storage.

Observations made by farmers in several seasons have shown that these botanicals are

very effective in bean and vegetable pest management if and when they are used appropriately.

Questions (Q) from visiting farmer groups and responses (R) from host farmer groups

Q How long does it take for those botanicals to be effective in protecting the stored bean crop?

R It takes one year but regular checks have to be conducted and re-application effected as required.

Q What is your future expectation?

R We expect to collaborate with farmers in our neighbouring villages to find the markets of our products.

Q Have you used cow urine/slurry to control insect pests? *(This is a question from technology exporters in Hai district)*

R Yes.

Q How did you use it?

R Urine was collected and fermented for 7 days. The fermented urine was mixed with water at a ratio of 1 (urine):2-6 (water) and applied in the field.

b. Soil fertility Management

Kwa Lei farmers are involved in soil and water conservation through the African Highlands Initiative Project (AHI) in which different contour terraces and forage/livestock/fruit tree planting have been experimented with.

The farmers used *Tithonia* or *Vernonia* sp. to improve soil fertility. These herbs were used in two ways. First the leaves were picked and chopped (in a similar manner to the other villages) and secondly they were pounded, mixed with water and used as liquid extracts.

Preparation: In the first case, farmers picked about 100 gm (handful) of leaves, chopped and applied to planting holes. In the second case, farmers chopped about 3 kg of leaves, and soaked them in 10 litres of water for 7 to 10 days. The fermented extract was diluted with an equivalent volume of water and used as liquid manure at 1 cupful (about 150 ml) per plant. Farmers observed that the liquid manure provided nutrients faster than the solid chopped green leaves or animal manure.



Preparation of liquid manure using botanical or animal products



Kwa Lei farmer group explaining the use of green manure and leaf extracts for soil amendment and pest control respectively, on potato winter crop

4: Mbuzii Village

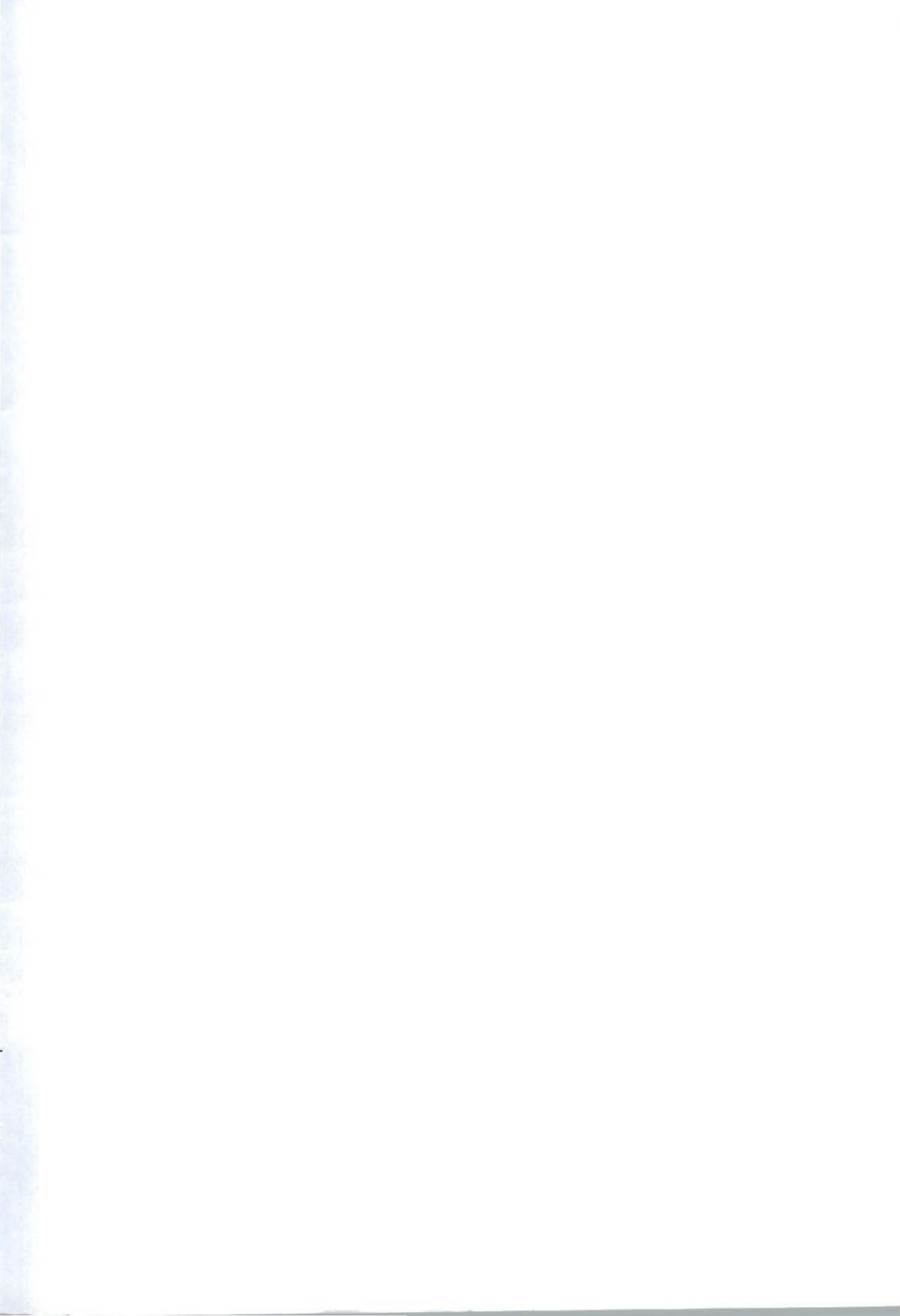
Farmers at this village have mostly been like their counterparts at Kwa Lei involved in soil erosion/fertility management and bean pest (*Oothenca* and aphids) management. They have been preparing terrace benches across the slopes of their farms. While constructing such benches, the soil is piled on the upper side of the slope

(Kiswahili 'Fanya Juu') or on the lower side (Kiswahili 'Fanya Chini'). The bench terrace technique helps to control soil erosion. Such benches are either planted with trees including fruits and forage trees or pasture grasses or both. The terraces are planted with beans, vegetables and maize.

Mbuzii farmers also use botanicals and wood ashes to control pests of beans and vegetables. The botanicals used were *Vernonia lasiopus*, *Tetradenia* sp., *Tithonia* sp., *Pycnostachys* sp., and *Moringa oleifera* (Mlonge in Kisambaa and Kiswahili). The preparation method for the botanicals for use as insecticides is similar to the other villages. The botanicals are also used for medicinal purposes to treat animal and human diseases.



Mbuzii farmer group with representative farmers and extension personnel from Kilimanjaro, Mbeya and Tanga regions.



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