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CRIP PROTECTION PROGRAM

Bembeke Bean IPDM Stakeholders' Workshop

65797



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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

Common bean, *Phaseolus vulgaris* is an important legume crop to resource poor farmers in Malawi. The current production levels continue to be low and insufficient to meet the consumption requirement even though land area put to the crop has been increasing over the years. There are several high yielding varieties of beans, which have been developed and recommended for production to the commercial and smallholder farmers. However, their adoption has been very low due to a number of production constraints such as widespread decline in soil fertility, poor crop management and insect pest and disease incidences that have lead to worsening food insecurity problem.

Following a farmer IPM briefing in 2001, an on-farm trial was collaboratively planned and designed by Bembeke farmers and extension personnel in Dedza district (central Malawi), Concern Universal

at Dedza, Malawi bean research programme and the International Centre for Tropical Agriculture (CIAT) with the objective of developing measures to reduce these constraints. Particular emphasis was placed on integrated management of insect pests and common diseases (IPDM) including bean stem maggots, aphids, pod borers sucking bugs (Table 1) and leaf diseases through use of improved high yielding bean genotypes, cultural practices, soil fertility improvement (khola manure) and use of indigenous botanical pesticides such as Teta, *Neuratanenia mitis*, Delia, *Tithonia diversifolia* and *Tephrosia vogelli*.

Table 1. Major bean insect pests identified by farmers and stakeholders at Bembeke extension planning area, Dedza district, Central Malawi

Common name	Scientific name	Local name
Bean fly	<i>Ophiomyia</i> spp	Ntchenche, Chiwawu
Cut worm	<i>Agrotis</i> spp	Chitukuza
Bean foliage beetle	<i>Ootheca</i> spp	Kam'mbatchi
Semi-looper	<i>Trichoplusia</i> sp..	Mbinimini

Pod borers	<i>Maruca</i> spp <i>Helicovera</i> <i>armigera</i>	Mphutsi
Pod suckers	<i>Clavigralla</i> spp, <i>Riptortus</i> spp <i>Anoplectnemis</i> spp. <i>Nezara viridula</i>	Gongoni
Aphids	<i>Aphis fabae</i>	Nsabwe
Storage weevils	<i>Acanthoscelides</i> <i>obtectus</i> and <i>Zabrotes</i> <i>subfasciatus</i>	Kafumbwe

The above meeting was organised and implemented in partnership by Bembeke farmers, national bean research programme, Dedza agricultural extension personnel, Concern Universal (CU) and the International Centre for Tropical Agriculture (CIAT). Thirty farmers (14 women, 16 men) from 8 villages in Bembeke extension planning area (EPA) including 3 village headmen, 3 CU personnel, 3 extension staff and

3 research staff participated in the workshop.

Objectives

The objective of the workshop was to facilitate Bembeke IPDM research farmers to

- Present 2002/03 farmer IPDM field research results
- Empower farmers through participatory IPDM activity planning
- Develop IPDM options for testing during the 2003/04 cropping season
- Report on their trip to southern highlands of Tanzania

On- farm field trials in 2002/03 season

Four farmers around Bembeke Agricultural Research Station conducted the trial. The design was Randomized Complete Block, replicated four times so that each farmer was a replicate. Napilira

bean variety was recommended for use and all replicates were planted in December 2002



The following were the treatments: -

1. No control
2. *Neuratanenia mitis* spray (Teta) and livestock manure
3. *Tithonia diversifolia* and *Neuratanenia Mitis* (Teta) spray mix
4. *Tephrosia vogelii* undersowing in a bean plot and spray application of *Neuratanenia mitis* (Teta)

5. *Tephrosia vogelii* spray application only
6. *Neuratanenia mitis* (Teta) spray application only
7. *Tithonia diversifolia* spray application only
(Deliya)
8. Livestock manure only
9. *Tephrosia vogelii* under sowing only

The plot size was 4m long with 4 rows spaced at 0.6m and a net plot size of 2m long with 2 rows spaced at 0.6m apart. Botanicals were crushed and soaked in water before filtering and spraying the mixture onto bean plants. Each farmer applied five sprays. Data collected included date of planting, aphid infestation at five scoring occasions and yield per net plot. Farmers gathered data on aphid incidence only, because the incidence of the other insect pests was very low in this season. Grain yield data was recorded for each treatment and the data subjected to analysis of variance. The results generated were presented at the workshop by each of the four farmers and workshop

participants discussed the results. Visits were organised to four villages to make observations on the adoption of the promising strategies in farmers' winter bean crop. The final plenary session of the workshop reached resolutions and plans for the next steps. The grain yield results generated by the 4 farmers were then analysed and are presented below.

Treatment 1 (Untreated control) had the highest % aphid infestation at all scoring occasions except one. Lowest aphid infestation was recorded when manure application was integrated with *Neuratanenia mitis* sprav (Figure 1).

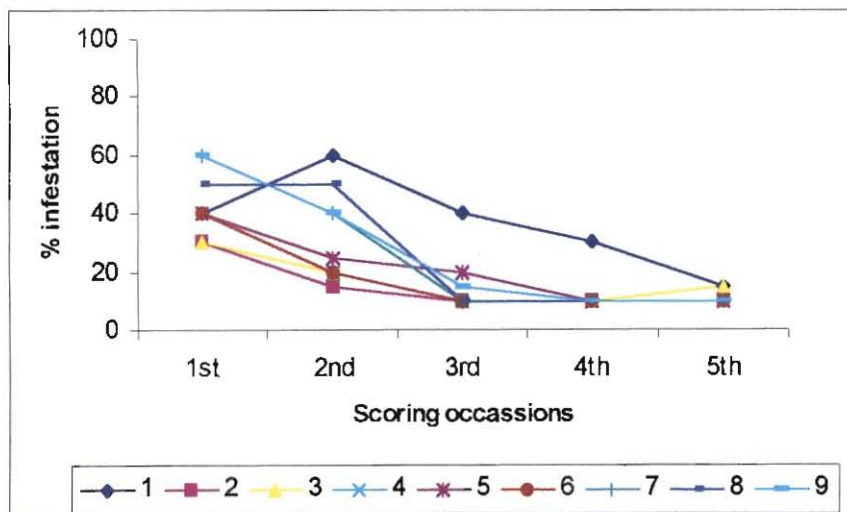


Figure 1. Bean aphid infestation in on-farm trials at Bembeke EPA, Dedza district, central Malawi during 2002/03 cropping season. (Legend: 1 Untreated control, 2 *Neuratanenia mitis* + Manure, 3 *Tithonia* + *Neuratanenia mitis*, 4 Bean/*Tephrosia* interplant with *Neuratanenia* spray, 5 *Tephrosia* only, 6 *Neuratanenia* only, 7 *Tithonia* only, 8 Livestock manure, 9 *Tephrosia* interplant)

Significant grain yield differences ($P = 0.01$) were recorded among the nine treatments. The least yields were obtained when the farmers took no action to control the pests (Treatment 1, Table 2) while the highest grain yields were obtained when farmers combined *Tithonia* and *Neuratanenia* sprays. *Tithonia* alone gave the least significant yields ($p=0.01$) among the botanical spray treatments used.

Table 2: Effect of botanical crude extract sprays for insect pest control on *Phaseolus* bean grain yield at four on-farm sites in Bembeke EPA, Dedza district, central Malawi in 2002/2003

Treatment	Farmer				Mean
	I	II	III	IV	
Untreated control	1587	1181	486	1111	1093 ^e
Bean/ <i>Tephrosia</i> interplant	1667	2708	556	1041	1493 ^{de}
Livestock manure	2083	1319	1805	2638	1961 ^{cde}
<i>Tithonia</i> only	2013	2638	2222	2055	2232 ^{bcd}
Bean/ <i>Tephrosia</i> interplant with <i>Neuratanenia mittis</i> spray	2986	2069	1806	1875	2309 ^{abcd}
<i>Neuratanenia mitis</i> spray and Manure application	2083	2361	2778	2430	2413 ^{abcd}
<i>Tephrosia</i> spray only	3056	3750	2500	2361	2917 ^{abc}
<i>Neuratanenia mitis</i> spray only	3611	3888	2861	2708	3267 ^{ab}
<i>Tithonia</i> and <i>Neuratanenia</i> spray	4028	4097	3056	2083	3316 ^a
C.V.%					11.3
Significance level					**
LSD _(0.01)					1058

The results indicated that botanical sprays were effective in the control of aphids and that their effect was greatest when control methods were integrated i.e. when a combination of botanicals was applied or when a botanical spray was integrated with soil fertility improvement through green manure (*Tithonia*) application. These findings that *Neuratanenia mitis* and *Tephrosia vogelli* are effective pest control botanicals agree with results generated by farmers in Mbeya, southern highlands of Tanzania. However, the results presented by Malawi farmers have further shown the importance of combining several control strategies in increasing the benefit that can be derived from the use of these botanicals.



Farmers expressed satisfaction in that their results were promising and they could detect the strategies to promote in their individual fields. However, participating farmers and the other stakeholders agreed on the need to scale up experimentation with the same strategies for a second season (2003/04) by involving a large group of farmers and make observations on the other important insect pests such as bean fly, bean foliage beetle, pod borers, pod sucking bugs and soil fertility management strategies. It was also agreed that there is need to determine the appropriate doses of such promising botanical pesticides like *Tephrosia*, *Gnidia*, *Neuratanenia* and *Tithonia* as well as obtaining the active chemical constituents of the different materials.

Issues from the trip report to Mbeya in Southern Tanzania

Five farmers (3 women, 2 men) and 2 technical staff (one each from Malawi research programme

and Concern Universal) were facilitated by CIAT to conduct a learning visit to Mbeya IPDM farmer groups in August/September 2003. Within 2 months of their return from Mbeya, the 5 farmers from 2 villages were able to sensitise 392 other farmers in 8 villages in Bembeke. Representatives from the 8 villages participated in the workshop. While in Mbeya, the Bembeke farmers identified the following important operational participatory activities, which they found appropriate for improving their general knowledge and IPDM skills:

1. Village information centres
2. Formation of community based organisations (CBOs)
3. Exchange visits

Farmers and local leaders agreed to establish 8 village information centres to be used by all the 392 IPDM participating farmers in Bembeke communities. Members also proposed that income-generating associations formed with the assistance

from Concern Universal should operate as cooperatives similar to those observed in Mbeya.

Farmers learnt a lot from the study tour, particularly regarding income-generating activities, which have improved the standard of living of their counterparts in Mbeya. They appreciated the importance of field visits and therefore proposed more field visits into other areas. Participating farmers and local leaders were keen to strengthen their efforts in maintaining linkages with research and extension agents. Farmers unanimously agreed to continue experimenting with new and traditional technologies, and promote them through field demonstrations, field days and cross visits.

Planned field activities for 2003/2004 cropping season

3. Demonstrations on bean varieties and time of planting

To generate further pest control strategies,

decided to evaluate the effect of planting two varieties on the incidences of pest and diseases. Depending on the pest, delayed planting or early planting may avoid pest and disease incidences.

1. Continue with studies on the effect of different botanicals on insect pest population and crop yield. This study is to be undertaken in five villages with five farmers per village.

2. Determine rate of application for botanicals

Up to date, no farmer knows the actual amount of botanical to use in specified amount of water for effective pest control. The farmers therefore decided to embark on activities that should determine the rate of application for the different botanicals.

5. Bean demonstration plots

One plot per village to demonstrate the effect

of spraying botanicals on yield of two varieties, Sugar 131 and farmers local seed.

4. IPM practice

All members of the IPM group volunteered to produce at least 0.1 hectare of either, Napilira and Maluwa varieties from their stocks and use botanicals to control insect pests.



6. Proposed Work plan for 2003/04

<i>Activity</i>	<i>Target</i>	<i>Time frame</i>	<i>Responsible personnel</i>	<i>Resources</i>
<i>Preparation of land for IPM demos</i>	13 per village	4 th Week of Nov 03	Farmers	Hoes, Ropes, Tapes, manure and seed

<i>Sourcing seed and botanicals</i>	12 kg seed of sugar 131 and climbers	4 th week of Nov 03	Entomologist	Seed and fuel
<i>IPM awareness creation</i>	13	Nov – 1 st week of Dec 03	Village Chiefs and farmers	Exercise books and pens
<i>Set up village info centres</i>	8	June 04	Farmers	Building materials
<i>Exchange visits and study tours</i>	1	July- Aug 04	Entomologist and Concern Universal	Meals, vehicle and accommodation
<i>Determine rate of application</i>	8	Dec 03- Apr 04 May- Nov 04	Farmers and extension staff	Containers of different sizes
<i>On-going IPM research</i>	8	Apr- May 04	Farmers, extension	Seed and botanicals
<i>Field days</i>	2	Mar- Apr 04	Farmers, Extension staff and CU	Transport, refreshments and posters

List of participants

Village	Name	Title
Simuka	Mr Habula Photcho	Farmer & Village Headman
	Mr M Chankhandwe	Farmer
	Mrs L Saiwa	"
	Mr N Jabesi	"
	Mrs L Kadeweze	"
	Mrs N Mwase	"
Kamgulitse	Mr B Mpale	Farmer & Chairman IPDM Group
	Mr E Kachigololo	Farmer & Village Headman
	Mr H Magombo	Farmer
	Mrs S Kamwendo	"
	Mrs S Sitolo	"
Kuthindi	Mr C Kalimwayi	Farmer
	Ms F Banda	"
	Mr G Sinsamala	"
	Mr E Filipi	"
	Mrs M Kacheyo	"
	Mrs M Kadosa	"
	Mrs L Grevazio	"
	Mr F Kampita	"
	Mrs T Chakakata	"
	Mr G Mbendera	"
Kauye	Mr G Pio	Farmer & Village Headman
	Mrs I Makalitchi	Farmer
	Mrs T Chakakata	"
	Mr G Mbendera	"
Kauye	Mr G Pio	Farmer & Village Headman
	Mrs I Makalitchi	Farmer

	Mrs J Chakuka	„
	Mrs E Chilumba	„
	Mrs T Grevazio	„
	Mrs D Siyasiya	„
	Mrs M Mtokoma	„
	Mrs L Kizito	„
	Mrs O Sinsamala	„
NGO staff	Mr J Mapemba	Prog. Manager, Concern Universal
	Ms B Chibambo	Project Officer, Concern Universal
	Mr A Chikhasu	Extension Facilitator, Concern Universal
Research staff	Mr H Mlenga	Bembeke Station
	Mr P Mviha	Entomologist, Chitedze Station
	Mr J Sipuni	Research Attendant, Bembeke
	Dr E Minja	Entomologist, IPDM Project Leader
Extension Staff	Mr W G Ndhlovu	District Agricultural Officer, Dedza
	Mr M Mwachande	Assistant Development Officer
	Mr G Gamulani	Extension worker

Appendices

POEM ON IPM

This poem is dedicated to all farmers who use IPM methods on Beans

Title: "The Eye Catcher"

The eye catcher
The soul forgets not

The richer the memory
What is heard, settles down,
I have heard your name
To be IPM

What is heard never gets out of ears

The eye catcher
The soul forgets not

I will fight the good battle
The fight against hunger
The fight against poverty
The fight against enemies of farming
The fight to win good harvests

On our departure from here
Ladies and Gentlemen at home be ready
We will vacate from the house
The house will be honourably be called Resource
centre or Village information centre for wisdom of
IPM



Never will I go again to a local market at town
Off to buy sometimes expired chemicals for control
of pests
For I will use environmentally friendly botanicals

For you my garden
If you ever invite pests
I will plant onion and garlic as an interplant
So that pests can be repelled
This is free knowledge given by Mr IPM

Please Mr IPM
Conduct vigorous awareness campaign meetings
Through you we have known *Tephrosia*, Cow
urine, and Teta
Are free wisdom from Mr IPM

Mr IPM
Today is a good day
Winter beans, maize after harvest
One day all weevils will perish
It's a long time you have given problems
We now have *Tephrosia* and German thistle
(*Vernonia* spp.)

The eye catcher
The soul forgets not

Now poultry chickens are saved
As announced by Mr IPM
The control of new castle disease

Pepper + *Tephrosia* + ash concoction
Make chickens drink

The eye catcher
The soul forgets not

As Christianity fights to meet the Holy Place in
Heaven

I have also been encouraged to meet Mr IPM
Beans, tomatoes, Irish potatoes and vegetables

I have gathered courage to look at them

The eye catcher
The soul forgets not

There are a lot of challenges ahead!!

For my eyes are now open to meet Mr IPM

It is now my request that

You make frequent visits our Coordinators
To bestow us with wisdom

The eye catcher
The soul forgets not

WRITTEN by

Ms Loleta Kadewere, Farmer, Bemeke IPDM
farmer groups, November 2003 IPDM workshop,
Dedza district, Central Malawi



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