Farmers Exchange Visits Report
Relevance and Lessons

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Working Paper 4

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Farmers observing performance of Crotalaria before incorporation, Itope village Kyela
Striga species, the parasitic witchweeds, are widely spread in smallholder crops in semi-arid and sub-tropical regions of Eastern and Southern Africa. These weeds attack and reduce the yield of maize, sorghum, upland rice and finger millet in these regions. In many areas it is the crops of resource-poor households, which are particularly affected. They impose additional stress with which farmers, who have little resources for investments in crop production, have to cope in an environment characterized by marginal rainfall for cropping and declining soil fertility.

Since 1996 staff from the Department of Agricultural Research Development, Sokoine University of Agriculture and Extension in Tanzania and, Natural Resources Institute in UK have collaborated to develop integrated Striga management practices for rice crop. Studies have been undertaken with groups of rice farmers in Kyela district, in the Southern Highlands of Tanzania.

Through on-farm trials farmers came to appreciate that Striga infestation and poor rice production are associated with and indicators of low soil fertility. This in turn is a consequence of continuous rice cultivation in the absence of using any fertilizer or manure. While the field trials demonstrated that up to a 60% reduction in Striga numbers and a 40% increase in rice yield is achieved by using urea fertilizer, farmers decided they did not wish to invest scarce cash in fertilizer. Instead they became interested in the opportunity, also observed from the field trials, to improve rice productivity on Striga infested soils by introducing the green manure crop Crotalaria.

The current project is on “On-farm verification and promotion of green manure for enhancing upland rice productivity on Striga infested fields in Tanzania”. It is operating from October 2002 to March 2005 with aims to scale up the demonstration of using the green manure in rotation with rice in both Kyela (Mbeya Region) and Matambo (Morogoro Region).

This working paper reports on exchange visits made by farmers in villages where the project began activities in the 2003 crop season to sites in Kyela where farmer groups have been evaluating rice/green manure rotations for the past two seasons.

Further information on the project or further copies of this report are obtainable from:

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1. Introduction
Agricultural development worldwide is heavily dependent on effective research and dissemination of research findings. Despite extensive research outputs in Tanzania from the Agricultural Research Institutes (ARI), Universities and other colleges, little impact of some programmes has been observed at small-scale farm level. This calls for the need to re-orient research in agriculture and related fields to meet needs and aspirations of small-scale farmers who comprised about 80% of agricultural producers in the country. Any project aiming at improving agricultural research in the country for the purpose of strengthening agriculture performance at farm level must also strengthen the linkages in the dissemination of such technologies. These linkages are Farmer-Research-Extension, which comprises the system of technological dissemination or transfer.

2. Background information
The Farmer exchange visit approach, involves farmers who share a particular interest from one location visiting others elsewhere who have greater experience in managing the problem. This approach of technology dissemination;
- Helps to promote better farming by providing an opportunity for farmers to see and discuss the best techniques with one another and with technical specialists.
- Creates a situation in which informal contracts and learning can take place
- It encourages the host farmer(s) to play a prominent role in discussing and explaining the particular technology in question.

3. Case study: “Increasing rice production on Striga infested land by growing green manure”

3.1 Matombo Farmer exchange visits.
Researchers and extension staff have been working with farmer groups in Itope and Kilasilo villages in Kyela to develop a low-cost approach for the management of Striga in upland rice for the past four years. These farmers have been evaluating the use of Crotalaria or pigeon pea, grown in rotation with rice, to improve soil fertility and have gained considerable knowledge and experience of how to manage the green manure. The current project facilitated farmers in four other villages, two in each of Kyela and Matombo, to begin on-farm demonstrations of rice/Crotalaria or rice/pigeon pea rotations in the 2003-cropping season. It is however difficult for farmers to appreciate how to grow a crop they have not previously encountered so the exchange visits were designed to provide an opportunity for the new farmer groups to learn from the experience of farmers in Itope and Kilasilo. On May 21st 2003, a total of 10 farmers from Matombo division in Morogoro rural district (5 farmers each from Kiswira and Kibangile villages) accompanied by district and village agricultural officers traveled to Kyela district. They visited demonstration sites hosted by farmers in Kilasilo and Itope on 22nd - 23rd May 2003. On the following day farmers from Konjula (7) and Sinyanga (10) in Kyela also visited the demonstration sites.
3.1.1. Objectives of the exchange visit:

- To expose participating farmers from Kiswira and Kibangile to the activities done by their fellows in Kyela district.
- To allow farmers to exchange experiences and plan for the future use of the practices they observe.
- To assist farmers to gain confidence with what they are doing in the project so that they can explain, and teach others.
- To empower farmers to think of ways to improve the technology to suit their social economic environment.

3.2.1. Matombo farmers Visit DALDO’s office and Kilasilo village - Kyela:

May 22, 2003. Farmers from Matombo Morogoro rural districts firstly paid a courtesy call at DALDO’s office where introductions were made. The DALDO gave a brief note on agricultural activities in the district. He also advised them to take the visit as a special opportunity to learn by seeing and to be ready to practice and teach others when they returned home.

Farmers received a warm welcome from fellow farmers at Kilasilo village led by the farmer research group leader and village government chairman. After self-introductions and a welcome note the research group leader gave a brief introduction on their activities in the project. He emphasized their great challenge is to feed the growing population from the small pieces of land they have. Therefore they need to improve soil fertility to sustain continuous cultivation and to control Striga which is a big problem in their village. At the same time they need to reduce costs of production by using a cheap source of fertilizer and effective weeding methods in their plots. The visiting farmers then toured demonstrations from selected fields. Each host farmer explained what he/she had observed in his/her field.

1. Erasto Mwaipopo

At this field the visitors saw rice grown on plots that was previously planted with pigeon pea or Crotalaria (Marejea in Kiswahili) and, plots of Crotalaria and pigeon pea ready to be planted with rice next season. Mr. Mwaipopo explained to them that by looking at the crop stand in the field he expects good rice yield because there is now no Striga and the fertility has been improved. Then visiting farmers asked questions

Q: What crop was on the field before pigeon pea
A: Before Pigeon pea there was cassava for four consecutive years because the area was a hot spot for Striga infestation

Q: What is the trend Striga after planting Crotalaria and Pigeon pea
A: The infestation is diminishing; there are only 2 Striga plants in 5m²

Q: What was the crop before cassava
A: The plot was followed

Q: What crop will be planted next season
A: Crotalaria/pigeon pea then rice again

Q: What is best time to plow under the green manure plants

Rice after Pigeon pea
A: At the flowering stages

Q: What crop was in the field before rice
A: There was rice highly infested with *Striga*

Q: Do you burn the mulch before cultivation
A: I plow them under because burning will take away nutrients from the mulch

Q: Do you plant by recommended spacing
A: Yes, but part of the field

Q: What kind of planting method you prefer most
A: Both planting in rows and broadcasting

Q: What is the recommended planting date for rice
A: The end of December to January but sometimes we can plant up to 15\textsuperscript{th} February

Q: What are the other advantages of Crotalaria
A: It reduces frequency of weeding.

Q: How do you incorporate the Crotalaria into the soil
A: Slashing of Crotalaria is done before plowing under in the soil

Q: How do you prepare Crotalaria seed
A: After harvesting, threshing and winnowing are done

Q: Have you ever statistically compared the yield of rice in plots previously grown with Crotalaria from those not with Crotalaria.
A: No, but with assistance from our agricultural officers we are starting this season.

2. Sankey Kandonga

He had Crotalaria and pigeon pea in his plot, next season all plots will be planted to rice and a comparison will be done of the performance of the rice with and with out rotation with a green manure.

Q: When did you plant Crotalaria and Pigeon pea?
A: Planting was done in January
Q: what is the spacing for Pigeon pea
A: 1x1m\textsuperscript{2} to allow the canopy to cover the soil

*Issues raised:* It was observed that relative closer spacing of Crotalaria diminishes the growth of weeds and the need for weeding
3. Jail Mwakatage
He has Crotalaria, Pigeon pea and rice for comparison. Next year all plots will have rice
He explain the history of the project by pointing out that he sees Crotalaria and pigeon
pea as a savior because he could not afford inorganic fertilizers and in any case
sometimes they are not available.

Q: What is the size of the plots
A: 10 x 30m²

Q: Why do you apply ash in pigeon pea plot
A: To prevent ants from attacking the crop

After discussion Mr. Jail gave the visitors seeds of rice variety “Mwangulu” as gift so
that they can plant at their fields back home.. Mwangulu is a local rice variety known to
have high tolerance to Striga although it has difficulties with threshability.

4. Alfred Mwamundela
In his plot he has pigeon pea (variety Mali and line ICEAP00068) and bambara
groundnuts. He also showed rice grown after Crotalaria. He explained that Crotalaria,
pea and bambara nuts are good for improving soil fertility and at the same time
control Striga in the field.

Q: When was the pigeon pea planted
A: January 2003

Q: What was the magnitude of the Striga problem in your field
A: There was a lot of Striga but I expect that pigeon pea and bambara will reduce
the problem,

Q: What is your plan for next season
A: The rice plot will be rotated with Crotalaria

5. Agrey Aliko Mwamundela
In the field there was only pigeon pea, Crotalaria and rice because this is the first year he
has worked with the project. Next season all plots will be planted with rice and then rice
performance and yield will be used to measure the soil fertility improvement and the
trend in the number of Striga. No question was asked here.
6. Saidia Mwakafyuju

This site was different from others. It has cowpeas, Canavalia sp., pigeon pea and Crotalaria. Mr. Mwakafyuju explained that all these plants are grown for the purpose of improving soil fertility and reducing Striga infestation in the field. Next cropping season all the plots will be planted with rice. He explained that, part of the plot established with Crotalaria would not be plowed under but left to produce seed for the coming seasons.

7. Bernad Mwakalinga

He showed Crotalaria that was late planted, and rice in plots previously planted with Crotalaria. The rice was good compared to other plot that was under rice for two consecutive years,; Striga heavily infested rice on this plot. Here the visitors appreciated the benefit of Crotalaria because the attacked plot had very poor rice crop.

Q: How long have you been in the project
A: Since last year

Q: What was the crop in the field prior to the Striga infested rice
A: The area was under cassava for four consecutive years before it was established with rice, this is the second season with rice.

Q: How many times you have had left your land fallow
A: None

Q: What is your favorite way of planting rice in your fields
A: Mostly I preferred is the use of “Kambaku” (Ox-plow for cutting furrows) because is relative faster and more effective

8. Asegelisyse Mwaseba

As the chairman of the research group he had two separate fields. One is closer to the main road, easily accessed for teaching others while the other one is a bit far where he planted his demonstration plots. The field for teaching had rice crop, Crotalaria and pigeon pea plots. All were at early stages of growth because they were planted late.

Q: Why did you plant a bit late
A: The plot was planted late because I started planting others, and this plot was the last.

Q: Plants on one side are stunted why
A: I am still investigating but I suspect the effect of tree shade or horizontal movement of water on the soil due to land gradient.
Q: Why didn’t you use ash to control ants like your fellow Jail Mwakatage
A: I didn’t know it but I have now learned it from my fellow Mwakatage, in the other hand I am using it for flower eater insects.

Q: How frequently farmers have come to you requesting for Crotalaria seed and advises in general
A. They have been visiting me several times and the records are kept.

The big demo plot had the following dimensions
-Rice followed Crotalaria mulch: 7x 20m²
-Rice followed Crotalaria ploughed under: 7x 20m²
-Rice after rice supplied with approximately 50 Kg Nha⁻¹ :7x 20m²
-Rice after rice without fertilizers: 7x 20m²

He explained that the plots that had Crotalaria were weeded once while others were weeded twice
The plot was attractive and all visitors had a good time to judge the technology by visual assessment of the rice stand and good performance of the panicles.

Then visitors were taken to Mwaseba’s other field done in collaboration with ARI-Uyole in which the visitors had an opportunity of seeing how the rice is performing in plots fertilized with urea, rice husks and burnt rice trashes. They were also shown another parasitic weed of economic importance in lowland rice production found in Kilasilo village, known as Ramphicarpa fistulosa

WRAP UP SESSION
The group chairman explained a short history of the project and the research group. Initially there was an IFAD project in the area providing credit to farmers for purchase of inorganic fertilizer. Along side with this came ARI Ilonga with research on the use of urea to control Striga. The fertilizer urea rates tested were 0, 25 and 50 kg N urea/ha. After the donor ceased giving us credit for purchase of inorganic fertilizer, this made us to re-think for an alternative for improvement of soil fertility and hence control of Striga. The rate of 50Kg N/ha was found to be very effective in the control of Striga, but farmers involved noted that unavailability and higher price of urea fertilizer was beyond their reach. Therefore, the alternative was suggested that to use Crotalaria and pigeon pea to fertilize the soil at the same time reduce the incidence of Striga infestation and other weed species in the fields.

The group started with five participating farmers but today there are 26 active farmers who are participating in control of Striga and Ramphicarpa fistulosa in lowland rice. The group is aiming for much higher rice production for the betterment of its community members. They have organized themselves to form a saving and credit society namely; KIMBALU abbreviations from (Kilasilo, Mbako and Lubele, the names of sub-villages forming Kilasilo village).

Members of the research group agreed that from next season they would be assisting each other in planting operations to reduce costs and to observe proper planting dates.
**Issued raised by the visiting farmers.**

In the light of the observations made visiting farmers raised the following issues:

Q: Why didn’t you prefer producing maize for rice supplementation
A: Maize is normally grown along the river valleys and at home gardens. Meanwhile it is off-season for its production despite the fact that is less preferred to rice.

- Farmers from Matombo division were much impressed with the effort made by their Kyela counterparts in improving their rice production through improving soil fertility by the use of green manure (Crotalaria and pigeon pea). They argued to improve rice production by improving soil fertility, reducing Striga infestation by using pigeon pea and Crotalaria.

- Village chairman was urged to make sure that the technology reaches and is practiced by other farmers who are not members of the existing Farmer Research Group for the wellbeing of the community at large. The central government was requested to support and facilitate the dissemination process of the beneficial technologies instead of leaving to the donors alone, who have already supported research trials.

- They gave an advice to their fellow farmers to establish some fruit fields. They argued that, because oil palm is doing well in the area it is better to establish coconut trees as well to increase sources of income.

**Word of Thanks and Remarks**

Farmers from Matombo division were happy with what they saw in the fields and they urged their fellows in Kilasilo village to keep up what they are doing and, they called upon all those who have not joined the group to do so in order to benefit from what others are enjoying. They thanked them for their agricultural efforts, unity and hospitality showed to them. Visiting farmers promised to take the message to Matombo villagers and live on what they learned from them, with hope that in the near future they will be visited by fellow Kilasilo farmers to see what they have achieved from what they had learned there. Then there was lunch and dances by Kilasilo farmers followed by an exchange of gifts from both groups.

**3.2.2: Matombo Farmers Visit Farmer Research Group at Itope-Busale village**

On the second day of their visit to Kyela farmers from Matombo visited the Itope-Busale Farmer Research Group. The tour started with a short welcome note from the host chairman, in which he called upon all guests to take their time to learn what has been prepared for them in their village. After introductions from both groups the tour began.

**1. Lyson Kayuni**

In his field he had Crotalaria and rice following after Crotalaria planted last season. He said that the advantages of growing rice after Crotalaria are the improvement of soil
fertility, *Striga* reduction and general weed suppression. He said that, in the plots previously planted with Crotalaria the present rice crop is vigorous and *Striga* incidence has been much reduced.

Q: Why is the growth of Crotalaria in this field not as good as expected?
A: It was affected by drought immediately after sowing.

Q: Do you have enough Crotalaria seed for the coming season in case you are not going to harvest enough from your plot?
A: Presently I don’t have. I expect to request from Kilasilo villagers.

2. **Samson Mwakanyamale**
He is the chairman of the research group and this is his first year in the project. In his plots he had Crotalaria for seed and Crotalaria already plowed under, pigeon pea and rice each on plot sizes of 10x30m2 as agreed by the group. The crops looked good but with some shade effect on some plots because of trees around.

Q: Part of your research plot is under shade, this can not interfere with your research findings?
A: Yes, it is a mistake because this is my first time in the project, it will be shifted to another plot next season.

Q: What are your future plans?
A: I will expand the area under Crotalaria so as to fertilize my field as large as I can.

3. **Edward Mwang’onda**
He had Crotalaria and rice following after Crotalaria. The crop was good. He explained that the plot planted with rice after Crotalaria was weeded only once compared to the rest {which were weeded at least twice). His future plans are to scale up the area under Crotalaria.

Q: What was crop growth like before you started rotating with Crotalaria?
A: Earlier the crop was good but with time the soil fertility started dropping and *Striga* started coming up but after Crotalaria the crop is good and next season I will expand the area under Crotalaria.

Q: What was the indigenous control measure for Striga?
A: An infected field was put under cassava production for 3-4 years before return to rice. After *Striga* appeared rice mono cropping is not advised.

Q: Was *Striga* a problem in your field some years ago?
A: No, the incidence is of recent because fertility is declining.

Q: When did you first hear of “Kyumika” (*Striga*)?
4. Yosufu Kayui
His demo plot was away from the main field of rice and it was planted very late. The general performance of the crop was poor. The farmer was not there to explain. This was an example of a poor demonstration plot.

5. Rehema Mwalaba
She showed rice grown after Crotalaria. It was a good crop

Q: What was the yield before Crotalaria
A: Estimated 3 bags per acre

Q: What are the future plans
A: To expand the area under Crotalaria

Then farmers were taken to see the plot belongs to Mwema’s wife which was highly infested by *Striga asiatica*

6. Asajenywe Mwakitubwa
He has Crotalaria and rice after Crotalaria. There was no question; the plots were very good.

WRAP UP SESSION
There was speech of thanks from Matombo farmers promising to put all they had learnt from the visit into practice. They also called upon all people who haven’t yet joined the project to do so immediately because they are lagging behind. Agriculture officers who accompanied the visiting farmers emphasized on the practical employment of the technology into their fields in Matombo and called other farmers so that the technology can have a wide spread. Then there was luncheon prepared by the hosts

GENERAL OBSERVATIONS
1. Farmers were confident on what they were doing because they were bold enough to explain themselves and answer fully all questions raised by their fellow farmers.

2. The size of their experiment/demonstration plots was big enough for practical assessment of the technology.

2. Most of the demonstration plots were situated in their main fields making it easy for farmers to attend the demos while attending their main field. This will make it easy to practice the technology in whole of the main field

Lessons Learned
From the visits farmers learned the following
- Strong farmer, research and extension linkage enhances technology transfer
- Better management of soil fertility through use of green manure can improve crop (rice) yields and minimize the problem of *Striga*. 
- The importance of keeping records in order to be able to evaluate success and failures of agricultural activities
- The importance of farmers organizations in accessing and owning technologies
- The importance of research institutions in enhancing agricultural development
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15. Saidia Mwakafyuju  “Member of FRG”
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3.3. Sinyanga and Konjula (Njugilo) farmers exchange visit to Kilasilo and Itope -Busale villages:

3.3.1 Visit to Farmer Research Group Kilasilo village

Farmers from Sinyanga and Konjula (Njugilo) are growing Crotalaria and pigeon pea for the first time this season and so were brought on the exchange visit to see what their fellow farmers are doing. The Farmer Research Group Chairman Mr. Mwaseba gave a brief welcoming note and introduction before farmers proceeded to the fields.

1. Asegelisye Mwaseba

He has two separate plots one is close to the main road he said this is for teaching others while the other one is away where he planted his demonstrations. The plot near main road had Rice, Crotalaria and pigeon pea all were planted late as they were found in their early stages of growth.

His main demonstration plots had
- Rice followed Crotalaria mulch: 7x 20m²
- Rice followed Crotalaria plowed under: 7x 20m²
- Rice after rice supplied with 50 Kg N ha⁻¹: 7x 20m²
- Rice after rice without fertilizers: 7x 20m²

He explained the plots that had Crotalaria were weeded once while others were weeded twice. The plot was attractive and all visitors had a good opportunity to judge the technology by visual assessment of the rice stand.

Q: What do you do with the Crotalaria in your field
A: After reaching flowering stage I slash/cut it and then plow under

Q: Are the Crotalaria stalks contributing to the fertility of the soil
A: Yes therefore after threshing seeds the stalks are returned to the field because they also contribute to the soil fertility.

Q: How was the stand of rice before Crotalaria
A: The rice crop was poor because of low soil fertility and a high Striga infestation. Therefore Crotalaria had increased soil fertility and reduced Striga infestation.

Q: Is it important to plant by seeding in rows?
A: Not necessarily, you can broadcast as well, though broadcasting is simple but more seed is used compared to when planting is done by planting in rows.

Q: What if we burn the sticks
A: Fertility will be lost
Q: When to plant Crotalaria
A: It is important to observe planting dates of rice crop, that is the best time for planting Crotalaria.

Q: What is the logic of having plots of Crotalaria incorporated and others not incorporated?
A: To have comparison in yield. How much do I loose for not incorporating Crotalaria in plots that are reserved for seed.

3. Alfred Mwamundela (The farmer was absent therefore his brother, also a participating farmer, gave the explanation)
In his plot there were pigeon pea (varieties 00040 and 00068) and bambara nuts. Visiting farmers were also shown rice grown after Crotalaria. They were told that Crotalaria, pigeon pea and bambara nuts are good in improving soil fertility and at the same time are effective in *Striga* control.

3. Aggrey Aliko Mwamundela
This is his first year of trying to improve rice production so in his field there was pigeon pea, Crotalaria and rice. Next season all plots will be planted with rice and then rice yield performance and number of *Striga* will be used to reflect the efficiency of green manure in soil fertilization. No question was asked here.

4. Saidia Mwakafyuju
This site was different from others that it had cowpeas, Canavallia sp. pigeon pea and Crotalaria. He explained that all these plant are grown for the purpose of improving soil fertility and reducing *Striga* infestation in the field. Next cropping season all the plots will be planted with rice.

Q: What is the size of the individual plots
A: All are 10x30m² as agreed during preparation meetings.

Q: What amount of Crotalaria seed was used in the plot
A: Only 1kg as given to other farmers.

Q: How was Crotalaria planted?
A: Land preparation was done then broadcasting followed, without covering the seed.

Q: What was the aim of establishing cowpea in the field?
A: They are mainly for food and soil fertility improvement.

5. Jail Mwakatage
He has Crotalaria pigeon pea and rice for comparison. Next season all plots will have rice. He explain the history of the project by pointing out that he sees Crotalaria and pigeon pea as a savior because he couldn’t afford inorganic fertilizers and sometimes they are not available.
No questions were asked here.
6. Erasto Mwaipopo

At his plot visitors saw rice after pigeon pea, rice after Crotalaria and a plot which has Crotalaria and pigeon pea ready for next season. He explained to them that from the stand and crop vigor he expects a good rice yield because there is no *Striga* this season and the fertility has been improved.

Q: What are you going to do with Crotalaria seed
A: I will sell seed after satisfying my needs

Q: In future what kind of crop will you prefer most in your fields, Crotalaria or pigeon pea
A: I will use both of them

Q: We are very impressed with your work and field results at large, but my concern is where to get seed for green manure crops
A: Good source is from your neighbors within and outside your village

WRAP UP SESSION
The group chairman explained a short history of the project and the research group. The research on *Striga* control started by using Urea fertilizer 50kg N/ha and 25kg N/ha. 50Kg N/ha was very effective in the control of *Striga* but farmers noted that unavailability and higher price of fertilizer Urea was beyond the reach of majority of small-scale farmers. Therefore the best alternative was to use Crotalaria and pigeon pea to fertilize the soil at the same time reduce *Striga* infestation and intensity of other weeds in their fields.

The group started with five participating farmers but today there are 26 farmers who participate in control of *Striga* and *Ramphicarpa fistulosa* another parasitic weed found in lowland rice in their village. The group has been organized to form a credit society namely KIMBALU(Kilasilo, Mbako and Lubele the names of sub-villages forming Kilasilo village)

Future plans in rice production
1. They will improve rice production by improving soil fertility, reducing *Striga* infestation by using pigeon pea and Crotalaria

2. They will be assisting each other in planting operations to reduce costs and they will observe proper planting dates.

3. Visit to Farmer Research Group at Itope-Busale village

Then the visiting team started off to Itope Busale, the tour started with a short welcome note from the host chairman. After Introduction of both farmer groups the tour began.
1. Lyson Kayuni
In his plot he has Crotalaria and rice after Crotalaria. He said that the advantages of growing rice after Crotalaria are improvement of soil fertility, *Striga* reduction and weed suppression.

Q: Why the Crotalaria in the field are not as good as they are supposed to be
A: They were affected by draught immediately after planting

2. Samson Mwakanyamale (Chairman of the Group)
He is the chairman of the research group although this was his first year in the project. In his plots he has Crotalaria for seed and Crotalaria already plowed under, pigeon pea and rice plots each by the size of 10x30m² as agreed by the group. The crop was good though shade from the near trees has some negative effect in parts of the plots.

Q: Why did you locate the research trial where there is shade
A: It is a mistake because this is my first time in the project

Q: What are your future plans
A: I will expand the area under Crotalaria so as to fertilize my field as much as I can

3. Asajenye Mwakitubwa
He has Crotalaria and rice after Crotalaria. There was no question, the plots were very good.

**WRAP UP SESSION**
All farmers sat together and evaluated their tour. Visiting farmers appreciated what they saw and they promised to use what they had learnt in their own fields. They also promised to explain what they had observed to all those who didn’t have a chance to participate in this exchange visit. They were also allowed to make exchange visits, because the *Striga* research has built a bridge that was not there before this trip.
## List of participants

### Konjula (Njugilo) village
1. Andrea Mwakasege
2. Jacob Mwajobele
3. Aden Mwakatabale
4. Twitikege Jungwa
5. Jackson Salim
6. Frank Mwaisumo
7. Francis Mwalyagile

### Sinyanga Village
1. Luskelo Kawilo
2. Asajinie Mtawa
3. Labson Mwankimba
4. Andwele Mwalukimba
5. Juma Mtawa
6. Franka Panja
7. Bosco Njetile
8. Ezron Mwaijambo
9. Henry Simfukwe
10. White Mwansasu

### Itope village
1. Samson Mwakanyamale
2. Edward Mwang’onda
3. Abdallah Mbalangwe
4. Lyson Kajuni
5. Asajenye Mwakitubwa
6. Goodluck Masebo
7. Reheme Mwalaba
8. A. Andendekisya Mwantwango
9. Oden Simtowe
10. Yusufu Kayui
11. Mwema Hamis
12. Hamis Mwema
13. Jim Mwakibinga
14. Gideon Mwang’onda
15. Christopher Mwaisabila
16. Amulike Mbukwa
17. Saada Mwema
18. Theresia Christopher
19. Mama Hamis
20. Mama Kayui
Annex 1
Farmer Research Group report from Kiswira on their visit to Kyela district, Mbeya region

On May 21\textsuperscript{st} 2003 a total of 10 farmers, five each from Kiswira and Kibangile Farmer Research Groups (FRG) in Matombo division in Morogoro rural district, made a visit together to Mbeya region to study witch weed (\textit{Striga}) control.

Farmers from Kiswira village were;
1. George Mkami…………….Chairman of the group
2. Adolph Mawango…………Secretary of the group
3. Albertina Thomas
4. Paul Mathew
5. Germana Peter

These are representative of the 18 members of the Kiswira Farmer Research Group. Ward Agricultural Extension Officer Mr. H. Kisumo, accompanied by Mrs E. Masangya Subject Mater Specialist from the district agricultural office, Morogoro, led the delegation.

\textbf{Purpose of the visit}
1. We as researching farmers, we were eager to learn from our counter parts farmers in Kyela how green manure can improve soil fertility and diminish the incidence of witchweed (\textit{Striga}) in rice plots and hence improve rice yield.
2. To learn about the usefulness of pigeonpea varieties (ICEAP 00040 “Mali” and 00068) on soil fertility improvement and in management of \textit{Striga} problem
3. To get acquainted with agricultural achievements already attained by our fellows in Kyela district following the practice of growing green manure in their fields.
4. To assess their readiness of recommended practices in agricultural production of rice.
5. To get acquainted with the witchweed species found in their locality, to see if these are the same species found in Matombo and the extent damage to the crop.

\textbf{Visit to Kilasilo village}
On 22\textsuperscript{nd} May 2003 we arrived in Kyela district in Mbeya region, Dr. Mbwaga facilitated our travel to Kilasilo village to meet our hosts. 14 farmers welcomed us.

Names of farmers whom we visited are:
1. Erasto Mwaipopo
2. Esnati Kandonga
4. Alfred Mwamundela
5. Saidia Mwakafyuju
6. Bernard Mwakalinga
7. Asegelisye Mwaseba
The visited farms were divided into three small plots for research activities as follow:

Plot 1: The plot was planted with Crotalaria previous season (2002) and planted with rice crop this season (2003)
Plot 2: The plot was planted with pigeonpea (ICEAP 00040 “mali” and ICEAP 00068) and planted with rice crop this season (2003)
Plot3: The plot was planted with rice in both two seasons (2002 and 2003)

Observations made from respective plots

Plot 1
- The crop establishment was excellent
- We were informed that Striga incidence was much reduced
- Weeding frequency was reduced from three to one
- Soil was looking fertile, loamy and relatively moist

Plot 2
- The crop establishment was excellent
- We were informed that Striga incidence was much reduced
- Weeding frequency was reduced from three to one
- Soil was looking fertile, loamy and relatively moist

Plot 3:
- The crop vigor was relatively weak
- The Striga incidence was observed to be high
- The plot was weeded twice
- Soil was observed to be less fertile

Visit to Itope village
On 23rd May 2003 we visited Itope village where we met 22 host farmers waiting after our arrival.

Names of farmers whom we visited their fields are:
1. Lyson Kayuni
2. Samson Mwakanyamale
3. Edward Mwang’onda
4. Yosufu Kayui
5. Rehema Mwalaba
6. Asajenye Mwaketubwa

These farmers are carrying out activities similar to those of their counterparts at Kilasilo village and have divided their fields into three small plots for research with the same crops planted.

Results from individual farmer’s fields resemble that observed in Kilasilo regarding the effects of Crotalaria, pigeonpea in improving soil fertility and management of Striga.
Lesson learned by Kiswira farmers from Kilasilo and Itope village’s visits

1. We have learned that Crotalaria is very important in increasing soil fertility and hence for the control of *Striga*
2. We have appreciated efforts by Extension agents in the area on awakening farmers on the importance of green manure in line with pros and cons of uses of chemical fertilizers
3. We have learned that self-creativity is important for agricultural development
4. We have understood that agricultural experts are working for our well being but not for the sake of their personal interests.

The agreed way forward after our visit to Kyela:

- To establish strategies to ensure that the knowledge gained reach every member of our research group and eventually every member of our village for the betterment of the entire community.
- To ensure that the knowledge obtained reach majority of our community, we shall look for assistance from religious institution in the village for technical and material support
- The group will establish means of becoming economically viable by selling the share of ownership of the group to any member interested.
- The present strategies is to raise the present level of production from 2 – 10 bags of rice per acre

Farmers’ opinions

- They have requested agricultural experts to use seminars for delivering new information/technology to their clients
- There is a request to Government and research institutions to assist some members from Farmer research group to attend agricultural shows and other events to learn agricultural improvement related approaches.
Annex 2
Report from Farmer Research Group from Kibangile village Matombo-Morogoro rural district:

Introduction
Our journey to Kyela district in Mbeya region for a learning visit started in Morogoro on May 21st 2003. We were accompanied together by Ward Extension Officer, Mr. H. A. Kisumo and Mrs. E. Masangya, a matter specialist from agricultural district office of Morogoro rural district. We arrived in Kyela at 1700hrs, met by Dr. Mbwaga at the bus stand Kyela.

Objective of our visit
To see and learned from our counterpart in Kyela the way they are using green manure in the management of both soil fertility and witchweed (Striga) problem
Our team was compost of
1. Filbert Roman……………….. Chairman of the group
2. Josephine Amos………………….Secretary of the group
3. Pilli Mohamed
4. Jumanne Rashid
5. Angelika Alois

On 22nd May 2003 we visited Kilasilo village where our hosts warmly received us. After introductory remarks we started visiting different well-established research plots. The following day, 23rd May 2003, we visited Itope village. Where we got a similar introduction to each other followed by visiting the research demonstration field plots

Knowledge gained from Kilasilo and Itope village visits

- We acknowledged that Crotalaria and pigeonpea are very useful in the improvement of soil fertility. This became obvious in plots, which were under green manure last season and this season planted with rice there was good rice crop stand compared to those under continuo rice.
- Striga incidence was observed to be very low almost zero in plots previously established with green manure
- Weeding frequency was reduced from three to one in plots under green manure.

The agreed way forward after a visit

After returning home, we will improve the way we conduct activities in our research plots. Also we are obligated to disseminate the technology for improving soil fertility and management of Striga through use of green manure to all members of the community

Journey back home
We traveled back to Matombo on 24th May 2003. The journey was safe and enjoyable
Acknowledgement
We are indebted to Dr. A. Mbwaga, the coordinator of the farmer exchange visit who facilitated us to pay a visit and learn from our fellow’s farmers in Kyela district.
Annex 3
Report by Ward Extension Officer about Matombo Farmers’ exchange visit to Kyela district, Mbeya region

Contents
1.0 Introduction
2.0 Rice fields
   2.1 Crotalaria
   2.2 Pigeonpea
   2.3 Farmers fields
3.0 Learning from the visit
   3.1 What they learned
   3.2 What is their agreed way forward
4.0 Comments
   4.1 Participants
   4.2 Kilasilo farmers
   4.3 Itope farmers
5.0 Indices
   5.1 List of participants
   5.2 Time table of the visit

1.0 Introduction
• Project on improvement of soil fertility and management of *Striga* problem on rice, sorghum and maize crops is being conducted in the village by researchers from ARI- Ilonga.
• Under the project activities, exchange visits involving farmers, extension agents and researchers have been conducted in Morogoro, Tanga, Dodoma and Mbeya regions with the aim of exposing them to different technologies at different environments.
• In May 2003, farmers from Kibangile and Kiswira villages in Matombo division in Morogoro rural district (list of farmers attached) made a visit to Kyela district in Mbeya region to learn by seeing on activities carried by their partners in relation to soil fertility improvement.
• Farmers who were selected for a visit were those owning fields with poor soil fertility and with high *Striga* infestation.
• Villages visited was Kilasilo and Itope both in Kyela district.
• The delegation consisted of 10 farmers (5 women and 5 men) accompanied by Extension agent and district agricultural officer from Morogoro rural. In general the visit was successful because farmers learned much from their fellow farmers.

2.0 Rice fields
2.1 Crotalaria
• Farmers with assistance from Dr. Mbwaga from ARI – Ilonga formed a Farmer Research Group to fight against diminishing soil fertility status together with increasing *Striga* problem.
Initially farmers in Kyela were using chemical fertilizer (Urea) for management of soil fertility but it was not affordable by many farmers due to high costs of fertilizer.

In turns, Dr. Mbwaga introduced the option of use of Crotalaria in place of Urea fertilizer.

The outcome of that option is very obvious in farmers’ fields during our visit. In plots previously established with Crotalaria and pigeonpea and later planted with rice this season, the crop looked vigorous and incidence of *Striga* was much reduced. This made farmer evident on the advantages of the that technology.

2.2 Pigeon pea

Two pigeonpea varieties ICEAP 00040 “mali” and ICEAP 00068 were planted in farmers plots to improve soil fertility. Rice crop grown after pigeonpea had good performance as was observed on rice plots previously planted with Crotalaria.

Advantages of Crotalaria

(i) It improves soil fertility
(ii) It reduces number of weeding
(iii) It is economically cheaper to chemical fertilizers

Advantages of pigeon pea (Mbaazi)

(i) It is a common food for human beings
(ii) It performs the same function as that of Crotalaria

2.3 Farmers fields

- Most of the fields visited are monocropped with rice
- Common method for their land preparation is the use oxen drawn implements
- We noted that farmers follow recommended practices in agriculture from planting to harvesting time.
- Their main cash crops are rice and cocoa.

3.0 Learning from the visit

3.1 What they learned

- How to establish Crotalaria
- The use of oxen drawn implements
- How Crotalaria increases rice yield
- The importance of establishment of Framer Research Groups
- The technique of dividing the field into two portions, one established with green manure and another established with rice in rotation
3.2 What was agreed way forward?
   To produce enough Crotalaria seed for the coming field trials/demonstrations
   To broaden the knowledge of use of Crotalaria for fertility improvement to the rest of community members
   To motivate and assist farmers on the use of Crotalaria
   To urge farmers to establish good green manure plots in a competitive manner to beat what their fellow farmers in Kyela have achieved

4.0 Opinions from Matombo farmer research groups:
   4.1 Participating farmers admitted that despite being rice producers for a long time, of late they have come to learn improved methods of production especially on:
   - Reducing *Striga* incidence by improving soil fertility level
   - General management of rice fields
   - Selection of good quality seed
   - Better preparation of land for rice production

4.2 Kilasilo farmers
   Kilasilo farmers explained importance of having farmers research groups and having an account in the bank

4.3 Itope farmers
   Farmers in Itope village explained the importance of farmer groups for sustainable agricultural development
Annex 4: Field Day at Kilasilo Village

A.N.A. Mwambungu
DALDO Kyela District

Objectives of the field Day:
1. To create awareness on the use of Crotalaria to large number of farmers
2. To introduce to villagers the importance of using Crotalaria (Marejea) in paddy fields as alternative strategy for control of Striga and increasing soil fertility
3. To educate a large number of resource poor farmers living in Kilasilo to see that the problem they encounter in their upland rice production has got a solution within their easy reach.
4. To show to resource poor farmers that the use of Marejea or pigeon pea in rotation with upland rice will increase soil fertility and reduce Striga incidence.

Field Day: Day 1: 30th May 2003:
The field day was initially planned to be carried out on 30th May 2003, but it was not done because in the village a prominent person died in the village. The field day was then postponed to 2nd June 2003

Field Day: Day 2 June .02.03
The following people from the district attended and these included
   District Commissioner of Kyela district
   District Executive Director of Kyela district
   15 District Department Heads
   District Council Chairman
   40 Village farmers
   6 Farmer Research Group members, who facilitated the field tour
   5 Farmers from Jinai village attended
   3 District councilors
Farmers from Sinyang and Konjula villages failed to attend for various reasons.

Site for Demonstration:
The field of Farmer Research group member Mr. Saidia Mwakafyuju was used as center for demonstration. The following crops were observed and explained to the visitors by the FRG members
   The use of Marejea to increase soil fertility and control of Striga
   The use of pigeon pea in crop rotation with rice for control of Striga and increase of soil fertility.
   The farmer research group members explained to their visitors that Striga or Kyumika (in Kinyakyusa) was a real problem in their fields. They noted with concern that the problem of Kyumika becomes magnified when there is low soil fertility and less rainfall during the season. They also appreciated the achievement reached by their fellow research farmers in combating Striga. Majority of the visitors promised to participate in the next cropping season.
Collaboration:
The field day was made possible by the help of Ilonga Research Institute – Dr Mbwaga who provided us with 150 000 Tzsh, for management of the field day successfully. The district appreciated this contribution with thanks.
II: FARMERS EXCHANGE VISITS

Kyela Farmers visit Matombo

Background information:

The farmers exchange visit approach is used for the purpose to educating farmers by seeing, sharing information and experiences in solving a common problem. The visit is done so that farmers with little experience to learn from those with long experience of solving the problem or farmers to appreciate what others are doing. In addition, the experienced farmers can visit non-experienced to motivate their fellow and learning other interesting experiences. The Exchange visits enable farmers

- To have an informal interaction where Ideas, problems and success can be discussed
- To have a have farmers themselves create confidence on what they are practicing in their farms.
- To encourage farmers creativity in solving the problem

Kyela Farmers exchange visit

Kilasilo and Itope villages in Kyela District have been under a research to develop a low cost approach in the management of Striga for four years. Some technologies have been tested and proven to be efficient, but farmers decided to practice the use of Crotalaria and pigeon pea fallow because these are easy to practice, cheaper and environmental acceptable. On 21st May 2003, 10 farmers from Mororgoro rural visited Kyela farmers to learn the use of Crotalaria and pigeon pea in the control of Striga in their maize and rice farms. Five farmers from each village Kibangile and Kiswira represented. On 26th May 2004, a follow up visit was done by 10 farmers from Kyela district. This was meant to see what Morogoro farmers are doing after they have learned the technology from Kyela farmers. Five farmers from each of the villages Kilasilo and Itope accompanied by 2 Extension Officers visited Morogoro rural, at Kiswira and Kibangile villages.

Objectives of the exchange visit

To share experiences on improving soil fertility and reduction of the impact of Striga on the cereal crop after growing green manure.

Activities

1. The morning of 27th May 2004, Kyela farmers paid a courtesy call to a District Agriculture Office in Morogoro. The District Extension Officer was there to welcome farmers. He thanked them for sparing all other activities to come and visit their fellow farmers in Morogoro. She requested them to value the trip and make use of it for the betterment of the agriculture production in their farms. She wished them a nice trip and a good stay in Morogoro. After that short welcome note the farmers traveled to Kiswira village accompanied by one official from Morogoro Agriculture District Office.
2. Farmers arrived at Kiswira village; they were welcomed by their fellow farmers accompanied by the Ward Extension Officer, the Ward Executive officer and the village Government leader. The Village Government leader gave a short welcome note. Introduction was carried out to all participants on the visit including the research team.

3. Selected fields were visited

3.1 Constantine Antoni Lukoa

The plot is planted Crotolaria, pigeon pea and maize TMV 1 variety for the first year. All plots were planted on 20th March 2004. The plot is close to the main road so as passer by can see the field. Generally, the plots are good. The farmer confidently explained what he is doing in the trial to the visitors.

Q: Were you asked by other villagers about the trial
A: Yes big number of people asked about the trial

Q: Why the fertility of your field is so low while you said this was your first year to cultivate this area.
A: The field has been under continuous cultivation but it is my first time to cultivate this field

Q: The slope of your plot shows the possibility of soil erosion, what are you going to solve the problem of soil erosion
A: I will use terraces

* A course on water harvesting and soil conservation will be taught later

Q: Are there Striga in your plot
A: No up to now there is no Striga in my plot

Q: Have you see any benefit to grow Crotolaria
A: Since this is the first year therefore, the benefit of crotolaria is not yet to be seen

Q: Where is the plot for seed
A: Since the demand for seed is high therefore the whole plot will be left for seed

3.2 Albertina Thomas

There were two plots one was under maize after the Crotolaria and pigeon pea while another was under Crotolaria and pigeon pea for the first season. The first plot that was under maize after crotolaria and pigeon pea had poor maize in the control plot. On the other hand maize after crotolaria was better than maize after pigeon pea. The plot was good showing the results of the technology and the farmers gave good information on what she has been doing since last season.

Q: Why the size of plot is that much small
A: The plots are so small because are meant for research and teaching others farmers, but next year the plots will be larger than this season.

Q: Why are there two plots of crotolaria
A: The other plot belongs to another farmer

**Suggestion:**
In order to solve the problem of the slope furrow must be made across the slope. It is hard to make furrows but deliberate efforts must be employed to solve the soil from erosion.

**3.3 Otto Mzeru**

The plot had maize Crotolaria and Pigeon pea in the first year. The trial was planted on 6\(^{th}\) February 2004. The plot size was 15 x 10. He explained that crotolaria and pigeon pea were planted to solve the problem of low soil fertility and Striga infestation. He also showed the plot that had crotolaria and pigeon pea last season. Plots that were under crotolaria had health stalks than the one under pigeon pea.

Q: Why do you repeat the experiment.
A: The idea is to get good results since last season the experiment was affected by poor weather.

Q: The plots that had crotolaria last season had some Striga
A: The population of crotolaria was very poor.

**3.4 George Mkami**

The experiment was planted on 6\(^{th}\) of February 2004, there is maize pigeon pea and Crotolaria (Plot size 15x10). Last season pigeon pea and Crotolaria performed poorly because of weather, this season all the plots are doing fine. In addition, there is another plot that was grown a cover crop (Pueraria spp locally called Klaka from the name Clerk) which farmers decided to investigate. The observed that this plant has a very slow germination. He sow seeds on January but germination was observed on April.

Q: Why do you have a plot for Pueraria spp
A: I am investigating its ability to fertilize the soil and suppress weeds in the field.

Q: Crotolaria has reached a stage to being plowed under, when are you going to plow under
A: I left it for teaching purposes otherwise I would have plowed under.

Q: Did your neighbours show an interest on the technology
A: Yes a lot of them some have collected Crotolaria seed although they are not research group members.

Q: How did you know the spacing of maize
A: It is normally written on the bag
Q: What is the spacing for pigeon pea
A: 1 x 1 m²

Q: What are you going to do next season
A: All plots will be under maize in order to compare the performance of the crop

**Suggestion:**
Cut down the palm trees because they dry up the soil.
Don’t delay planting operation to ensure that the fertility enhanced is utilised immediately to avoid loss due to slope of your plot.

3.5. **Germana Peter**
The plot was under maize pigeon pea and Crotolaria all performing well the plot is situated close to the foot path so that who are passing by can learn. The farmers had problem in addressing herself therefore, the fellow farmers assisted her.

Q: What variety of pigeon pea have you planted
A: Mali

Q: How will you teach other farmers
A: Some comes to my home some are met on the way

**Suggestion:**
It is important to have a poster that will be informative enough to assist other farmers

3.6 **Lydia John**
Her plot has Crotolaria pigeon pea and maize all planted on the 6th February. All the plots are doing fine.

Q: Why did you plant Crotolaria and pigeon pea
A: These were planted to fertilize soil and control Striga

Q: Why all plots were planted on 6th February
A: That was the advice from the Extension officer

Then the showed the visiting farmers Mwangulu rice which was obtained in Kyela. The plot was first attacked by the army worms.

3.7 **Henry Sirili**
This is the first year. Pigeon pea and crotolaria were planted on the 4th March, maize was planted 10th March

Q: Why planting crotolaria and pigeon pea
A: To improve soil fertility and control Striga

Q: What are you going to do next season
A: All plots will be planted maize to compare the performance after maize.

Q: How will you compare the yield
A: By weighing the yield obtained

Q: What are your future plans
A: To extend the technology to a large area.

Q: Do you have a plot with Striga
A: Yes that is where the extension of the technology will be done

3.8 Antonia Antony
She failed to continue with the trial because of ill health.

3.9 Paul Matei Somvi
He has Crotolaria, pigeon pea and maize all were planted on 26th March 2004

Q: Why did you participate in this research group
A: To manage Striga though soil fertilization

Q: Why didn’t you use other sources of fertilisers like animal manure
A: Crotolaria and pigeon pea are the cheapest source of fertilizer

Q: What are you going to do next
A: Test by growing maize in all plots

3.10 Daudi Mdachi
He has Crotolaria, pigeon pea and maize all were planted on 10th of February. The plot of pigeon pea was intercropped with maize. The plot of maize was already harvested.

Q: Why did you practiced inter cropping
A: To make use of the open spaces between pigeon pea

Q: Where did you get the idea
A: I was advised by the Extension officer

Q: How was the yield of maize
A: Very poor because of poor soil fertility and Striga infestation

Suggestion:
He was advised to increase the size of the Crotolaria plot. In addition, the position of the plot being close to the church was an advantage for technology dissemination. Therefore, he was advised to make use of it.

Wrap up
The host farmers gave the history of their research group (appendix)
The visiting farmers congratulated their fellows for job well done. They appreciated that what was taught in Kyela is now in practice. They also appreciated the way the Kiswira farmers were conversant and confident on whatever they did in their plots. Kiswira farmers were advised to assist other farmers in case of problems so that the development will be for the whole group up to the village level. In addition, Kiswira farmers were challenged to improve the size of the plots in order to move to another stage of adoption.

Since the research group is expected to cater for other social activity in the village then the establishment of the Credit society was highly praised as a good start towards poverty alleviation.

The Ward Executive Officer apologized for having a long programme. On the other hand she commended the job done and suggested the extension of the technology to other villages, because about 33 villages are infested with Striga

Visiting farmers and their host and other guests had a meal and drinks together, there was exchange of gifts among farmer groups. The hosts showed a drama which encourage farmers to use scientific measures instead of wrong beliefs to control Striga in their fields

4.0 Kyela farmers visiting Kibangile village

On 28th May 2004 Kyela farmers visited Kibangile village. They were welcomed by the host farmers, after introduction farmers and accompanied by the research team started the tour. The field had two spp. of Striga, S. asiatica and S. forbesii. Maize was intercropped with maize but plant population was poor in addition, maize was sown later after pigeon pea had grown high.

4.1 Anjelica Aloys

This is the first year of the experiment. The trial was planted on 26th February 2004. There is pigeon pea, Crotolaria and rice. The farmer explained what he has done.

Q: Why did you plant late
A: There was a problem of obtaining seed

Q: What is the idea of using the technology
A: To improve soil fertility and control Striga

Q: Why the crotolaria is not yet plowed under
A: The intention is to obtain seed

4.2 Filbert Roman

He had two plots one was on the second season while the other was on the first season. That of second season is all under Mwangulu rice, the area that had crotolaria was good
followed by the plots which were under pigeon pea and rice after rice was poor. The treatments were obvious. This season there is Crotolaria, pigeon pea and rice, these were planted 16\textsuperscript{th} March 2004. The plot size is 7 x 41m\textsuperscript{2}. The plots are good, the situated along the foot path. On each plot there was a poster which can assist whoever passing by to read and understand what is done there. The posters were very informative hence, no question were asked, they attracted visiting farmers who promised to practice them in their field next season.

4.3 Abdul Ally

This is his first year, he has maize crotolaria and pigeon pea. Maize stand was poor because he replanted after the first crop dried because of draught and the spacing was poor. The plots were very small.

Q: Why are your plots so small
A: Admitted the mistake in the first year of the trial

Q: Where did you get the information of the technology
A: The Extension officer

Q: What variety of maize have you planted in the trial
A: Local variety

4.4 Josephina Amos

The trial was planted on 3\textsuperscript{rd} March 2004 it has pigeon pea, Crotolaria and rice. The plots are large and the crop is doing fine.

Q: What is the improvement in the yield
A: The yield has improved by 50%

4.5 Halima Ramadhani

The plots were planted on 6\textsuperscript{th} January 2004. The plot size was large. Farmers appreciated. The performance of the trial.

4.6 Hadija Salum

The trial was planted on 9\textsuperscript{th} February, it has pigeon pea, Crotolaria and rice. Plots are and impressive

Q: What is the plot size
A: 16 X 5 m\textsuperscript{2}

Q: What is the variety of pigeon pea grown
A: The variety of P(0040)
4.7 Kibangile Primary School
The plot is managed by the Primary School where pupils of Class 5 – 7 are taking part. The trial is doing fine.

Q: What is the spacing of pigeon pea
A: 1x1m\(^2\) but the space is so large next time intercropping will be done to utilize the space

Q: Is there a plot for seed multiplication
A: Yes

Wrap up and closing session

After the field visit, farmers were entertained by pupils. They had prepared Choir and poems which calling farmers to put together their efforts to curb the problem of Striga in order to improve their well being as a strategy in poverty alleviation.

The group chairman from Kyela praised their fellow farmer for commendable job they have done. It shows that the knowledge obtained during their visit Kyela is now in practice. He argued them to increase the size of their plots to enjoy the benefit of using Crotolaria and pigeon pea in their fields, because they have gone beyond exploration stage. Farmers from Kyela were impressed with the dissemination methods used here in Morogoro apart from farmer to farmer Primary school and the Church are used effectively. They appreciated that these social institutions are very important in information/technology dissemination.

Later farmers exchange gifts and have a meal together bid fare well to each other
The closing note emphasized on the extending the information /technology to other people in the village and outside the village. In addition the ties between Kyela farmers and Morogoro farmer was highly commended and called upon farmers to maintain and strengthen it beyond the scope of the project.

General Observation
- Farmers showed a good level of understanding on what they are doing in their plots, they were able to express themselves, and answer well all questions.
- The size of their experimental plots was small probably because some farmers are participating for the first time and or being in exploratory stage of the application of the technology.
- Most of the plots are within their main fields showing a good level of acceptance of the technology.
• Having informative poster in their plots as done by one farmer in Kibangile will assist dissemination of information/technology to other people in the village especially for plots which are adjacent to the roads or foot paths.

• The involvement of other social institution in the village like schools and churches is of vital importance in dissemination of information or technology as observed in Kibangile and Kiswira village.

• Using other means of reaching people in the village like the drama prepared by Kiswira village is a good machinery in driving the message to target population.

• Most of the plots were planted on the same date showing that the group organisation is strong and productive.

• Most of the farmers planted TMV 1 maize variety showing an opportunity of introducing the use of improved maize seed in the project.

From these observations It was learnt that
• The linkage between Research Extension and farmer is enhanced
• Farmers appreciated the use of the technology in improving agriculture production
• Records are very important tool in evaluation of the progress
• It is important to use various means in extending the information because no single method is efficient
• Research Institutions are very important in enhancing agricultural development

Appendix

1. The history of Tuwalole Farmer Research Group (Kiswira village)

The group started in 2002 with 20 members 8 women and 12 men. November 2002 group members were distributed with Crotolaria and pigeon pea (0068) seeds by Dr Mbwaga. The main objective was to plant these seeds to improve soil fertility and to control Striga.

On 30\textsuperscript{th} January 2003 the group attended a workshop which enable the members to
a. To understand the research activity, opportunities, potentials and threats in agriculture production
b. To enable the group to have a common goal and set a common strategy in implementing and developing Striga control measure
c. To gather baseline data that are useful in evaluation of the project

February 2003 the group started to conduct a Striga control trial whereby Crotolaria, pigeon pea and maize were planted in plots of 5x10m\textsuperscript{2}. The research team visited all plots for evaluation. On May 21,2003 the five group representatives joined representative from Kibangile to visit Kyela District to share experience with Kyela farmers who were in the project for 4 years. They saw how Crotolaria and pigeon pea cut the costs of using
industrial fertilizers. After the tour, the group disseminated the technology to other farmers in the village.

Other group activities
The group has a registered credit society. The group is disseminating Striga control technology/information in association with Catholic missionary institution in the village.

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35. Halima Ramadhani  
FRG Kibangile Morogoro

36. George Mkami  
Chairman FRG Kiswira Morogoro

37. Edward Mawango  
FRG Kiswira Morogoro

38. Alberta Thomas  
FRG Kiswira Morogoro

39. Magdalena John  
FRG Kiswira Morogoro

40. Otto Mzeru  
FRG Kiswira Morogoro

41. Siril Henry  
FRG Kiswira Morogoro

42. Isdori Malini  
FRG Kiswira Morogoro

43. Vicent Midongo  
FRG Kiswira Morogoro

44. Paol Matei  
FRG Kiswira Morogoro

45. Germana Peter  
FRG Kiswira Morogoro

46. Daudi Mdachi  
FRG Kiswira Morogoro

47. Michael Roman Mloka  
FRG Kiswira Morogoro

48. Antonia Antony  
FRG Kiswira Morogoro

49. Veronica Dominic  
FRG Kiswira Morogoro

50. Emma Mwenda  
FRG Kiswira Morogoro

51. Christa Revenus  
FRG Kiswira Morogoro

52. Anamaria Paul  
FRG Kiswira Morogoro

53. Phillipina Yakobo  
FRG Kiswira Morogoro

3. KILASILIO RESEARCH GROUP REPORT  
(KYELA FARMERS VISIT MATOMBO MOROGORO RURAL)

1. Introduction:  
The tour started from 26th May 2004 up to 29th May 2004. It included six farmers from Kilasilo, four farmers from Itope and two Extension officers from District Agricultural Office. The names of the participants are shown on the list of participants

2. Objective:  
The main objective of the tour was to visit Marajea fertility improvement trials that are conducted by Matombo farmers. This was done to exchange ideas and experiences on Striga control trials that are conducted by both villages.

3. Activities:  
a. A visit to Farmer Research group in Kiswira village  
On 27th May 2004 ten research plots were visited in Kiswira village, the plots belong to the following farmers

Konstantin Antony Lukoba  
Albertina Thomas  
Otto Mzelli  
George Shomari Mkami – Chairman  
Jeremana Petter
We saw nice plots of Marejea, pigeon pea and maize which were in a good stage of growth. We advised them to

- Increase the size of their plots
- Plant early on the on-set of the rain season
- Use Marejea to improve soil fertility, control *Striga* and reduce weed infestation
- Use contours to control soil erosion on steep slopes

**What was learnt from Kiswira village:**

- The way of dissemination of the Marejea technology by using the Church in the village.
- Their plots are close to the main paths and one of the plot is close to the church so that many people can see it
- They prepared a drama which convey a message on the use of Marejea technology to improve production instead of false beliefs
- The history of Kiswira group

**b. A visit to Farmer Research group in Kibangile village**

On 28\(^{th}\) May 2004 we visited Kibangile farmers research group. The visited plots are of

- Philbert Roman Balala- Chairman
- Anjelika Aloys- Vice chairman
- Josephina Amos- Secretary
- Abdu Ally
- Halima Ramadhani
- Hadija Salum
- Kibangile Primary School

Their plots were of Marejea, pigeon pea and rice. The plots were good but small we gave them the same advice as that we gave Kiswira farmers.

**What was learnt from Kibangile village:**

- Dissemination of marejea technology by using primary school pupils who are the future farmers.
- In each plot in the trial managed by the Chairman there was a poster showing the date of planting, weeding and the size of the plot.
- Short history of the group

**Acknowledgement:**

We would like to thank all who participated to facilitate the tour, these include

The leaders Dr A. Mbwaga and his colleagues
District Agricultural Office (Morogoro) Mrs E. Masangya
Ward Executive officer (Matombo- Morogoro) Grace Timoth Sholle, and Mr H A Kisumo (Extension officer Kisemu Division)

Kiswira village
Mr Patric Franasis-Village chairman
Leaders of the Catholic Church in the village
All farmer research group members

Kibangile village
Village chairman
Village executive officer
The headteacher
All teachers
All farmer research group members

On 29th May 2004 we started off to Kyela

Asegelisye Mwaseba
Group Chairman, Kilasilo

4. ITOPE RESEARCH GROUP REPORT
(KYELA FARMERS VISIT MATOMBO MOROGORO RURAL)

Introduction:
On 26th May 2004 we arrived at Morogoro where we met Dr Mbwaga. The next day we payed a courtesy call at Agricultural District office than we left to Matombo.

Activities:
We visited Kiswira village accompanied by District Agricultural officer, Ward Executive officer and ward extension officer. We visited nine plots that had Marejea, rice and pigeon pea. The crop stand in the field was good.

On 28th May 2004 We visited plots of six farmers in Kibangile village one of the plots belong to Kibangile primary school. The plot had marejea, pigeon pea and maize. The crops in the field were good.

What was learnt:
- They cooperate and coordinate filed operations like planting.
- Their plots are well attended
- They cooperate with extension officers, teachers and pupils
- The climate is warm like that of Kyela

Edward Mwang’onda
Group Chairman, Itope
5. DISTRICT AGRICULTURE OFFICE REPORT
(KYELA FARMERS VISIT MATOMBO MOROGORO RURAL)

1. Introduction:
The tour included six farmers from Kilasilo village and four farmers from Itope village, accompanied by extension officers M. Mwampaja and H. Mwangosi. The main purpose of the trip was to go and see efforts of Matombo farmers to control *Striga* in their maize and rice fields, previous season Motombo farmers visited Kilasilo and Itope village in Kyela District for the same purpose.

2. Leaving for Matombo via Morogoro
The journey started on 25th May 2004, we arrived at Morogoro on the same day. We met Dr Mbwaga and Mr. Massawe (ARI Ilonga) whom the next day together with Mr J Kayeke (ARI-Uyole) and Mrs Masangya (District Agricultural Office-Morogoro) accompanied us to Matombo.

We arrived at Mtamba the headquarters of Matombo ward around 11:00. There we met our hosts who had made all the necessary arrangement for out stay there. We started-off to our fist destination accompanied by Ward Executive officer Grace Timith and the extension officer H. Kissumo.

3. At Kiswira village
We were welcomed by the village government chairman, after introduction we went to the field. We started with the plot of Constantine A. Luka, but due to a shortage of time we visited only ten trials. The total number of participating farmers is 20 where eight are women.

3.1 What we saw in the field
- In Matombo there are two species of *Striga* (locally known as Sani) *Striga asiatica* and *Striga forbesii* while in Kilasilo and Itope there is only *S. asiatica*.
- The main crop in Kiswira is maize while in Kilasilo and Itope is rice.
- Apart from Marejea and Pegeon pea being used to fertilize the soil there is another cover crop called Clark (*Pueraria spp*). This was found in chairman’s plot
- The rains for the season of 2003/04 were not good for the crop
- Mwangulu rice from Kyela is performing well in Kiswira, it was planted in Lydia’s plot on behalf of the group. In addition she had maize and pigeon pea like other farmers
- Intercropping of maize and pigeon pea as a personal initiative of Mr Mdachi
- Improved varieties of maize Staha, TMV1 and pigeon pea Mali are used in the trials
- The plots size in the trial range from 5x10m² to 25x25m²
- The date of planting was observed by all participating farmers as directed by the extension officer
This was the second season for the trial but there is a number of farmers who showed interest and join the research group

3.2 Advice given
- Otto Mzellu was advised to make furrows across the slope because of the steep slope of his plot
- Participating farmers were advised to use the technology in large plots instead of the small ones which they have now

3.3 Wrap up session
A wrap up session was held before leaving for Mtamba. During the session
- The History of the research group was given. The group has a savings account in the bank. The group use the church for dissemination of the information about Striga control using Marejea and pigeon pea
- The group showed a drama which call upon farmers to fertilize their field by Marejea and pigeon pea to improve productivity instead of embracing false beliefs
- There was an exchange of gifts between newcomers and host farmers’ groups also there was meal and drinks for the newcomer
- The Ward Executive officer appreciated the technology and pointed out that all the 33 village in her Ward are infested with Striga
- Mr Kayeke appreciated the effort of farmer who inter-crop maize and pigeon pea, and emphasized on the use of improved varieties
- Dr. Mbwaga emphasized on the improvement on the size of the plots leaving the small plots which are used by participating farmers. He congratulated them for forming a credit society (SACCOS)

Other congratulations and encouragement were from Mr Mwampaja, A. Mwaseba and T. Kamwela. The session was closed and we left for Mtamba

4. At Kibangile village
The next morning we visited Kibangile where we met participating farmers, their leaders including a village government chairman (Yahya Selemani). There we introduced each other before a trip to the field. Due to shortage of time, we visited plots of six farmers and that of the primary school.

4.1 What we saw in the field
- The problem of Striga is of the same magnitude as that of Kiswira
- Their fields are infested with two species of Striga like Kiswira
- The knowledge to combat Striga is given in different ways by the primary school like a demonstration plot, choir and poems
- Crops which are used in their plots are maize and rice
- The average size of the plots is 15x15m²
- The variety of pigeon pea planted is mali
- Group members are increasing after appreciating activities of the group

4.2 Advice given
They were advised to increase the size of their plots in the following season

4.3 Wrap up session
At the meeting, Kibangile primary school pupils conveyed a message of *Striga* control by choir and poems. During the session

- The short history of the group was given by the vice chairman of the group
- On behalf of the visiting farmers, Mr Oscar Mbonge and Erasto Mwaipopo congratulated the group for the development reached and called upon them to continue with the same spirit. In addition Mr Mwangosi praised the effort of the school to convey the message of *Striga* control, while Mrs Masangya requested all participants to put into practice what they have learn from the tour.

Then newcomers were saved with lunch before leaving for Morogoro

**5.0 Conclusion**

Farmer exchange visits are very important and give a challenge to participating parties. Apart from meeting others, there are chances of exchanging ideas, experiences and encouraging each other in their efforts to control *Striga*. Therefore, the efforts of Project coordinator Dr Mbwaga, Tanzania government and the donors are highly acknowledged for facilitating this exchange visit.

Prepared by M. Mwampaja
District Crop Officer