



**AFRICAN UNION
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Semi-Arid Africa Agricultural Research and Development
Recherche et Développement Agricoles dans les Zones Semi-Arides de l'Afrique

REVIEW AND PLANNING WORKSHOP

**COLLABORATIVE STRIGA RESEARCH
AND CONTROL PROGRAM IN AFRICA**

22 JUNE, 2007

**AU-SAFGRAD
OUAGADOUGOU
BURKINA-FASO**

PROGRAMME

Chairman: Prof. S.K. Kim

**Rapporteurs: Charles The
Victor Adetimirin**

- 08:30-09:00** **Opening Session**
 Welcome Remarks - AU-SAFGRAD Director
 Presentation of Agenda - Mahama Ouedraogo
- 09:30-09:50** **Project Strategy for Coming Years - Prof. Soon Kwon Kim**
- 09:50-10:20** **Discussion**
- 10:20-10:30** **Coffee Break**
- 10:30-10:40** **Review of Country Activities Proposed for 2007**
 Burkina Faso - Omar Ouedraogo/Sanou Jacob
- 10:40-10:50** **Cameroon -Charles The**
- 10:50-11:00** **Cote d'Ivoire - Louise Akanvou**
- 11:00-11:10** **Ghana – Abdulai Mashark**
- 11:10-11:20** **Mali – N'tji Coulibaly**
- 11:20-11:30** **Nigeria –Prof. S.T.O. Lagoke**
- 11:30-11:40** **Nigeria –Ibrahim Kureh**
- 11:40-12:30** **Discussion**
- 12:30-13:00** **Overview of Practices and Lessons Learned in Striga Research
and Control – Charles The, Victor Adetimirin and
Prof. S.K. Kim**
- 13:00-13:30** **Work Plan for 2007**
- 13:30-13:40** **Any Other Business**
- 13:40** **Closing**

Opening Remarks and New Thrust of the Project

The Director of SAFGRAD, Dr. Abebe Haile Gabriel, gave the welcome address at the meeting. He observed that striga remains a problem in most parts of Africa. He noted that while NARS will set the agenda and implement striga control technologies, SAFGRAD will facilitate mutual learning, sharing of experiences and provide the platform for generating impact. He thanked Prof. S.K. Kim for his unreserved support, not only for the current initiative to control striga in West and Central Africa but for the efforts to deepen and expand the project through a continent-wide control of the parasite.

The director remarked that the project must not only be able to generate impact, it must demonstrate impact.

There are indications that the government of the Republic of Korea may be willing to increase the level of funding of the project, especially given the on-going efforts to expand the scope of the project. A major limitation has been the late submission of annual country reports by participants. This was responsible for the inability of SAFGRAD to secure funding for 2006

In addition to the countries currently executing the project in West and Central Africa, six new countries expressed interest in being part of the project. Only participants from four out of the six countries were represented at the meeting. The countries include Ethiopia, Sudan, Niger and Zambia. Representatives of Malawi and Botswana were not able to attend the meeting because of their flight schedule and the need to attend to other engagements.

Project Strategy for Past and Coming Years - Soon Kwon Kim

Major highlights of the presentation by Prof. Kim

- A variety that shows high resistance, demonstrated by low striga emergence, must have high tolerance to be of any value in infested areas. This is one of the key issues contained in the two papers Prof. Kim circulated during second day (Thursday, 2 June 2007) of the Consultative Meeting on Building Alliance for Striga Research and Control for Enhanced Food Security in Africa.
- While the on-going project would like to include sorghum, the resistant/tolerant materials currently available do not demonstrate resistance to a wide range of locally prevalent pests and diseases as in maize. This is one reason why striga-resistant varieties cannot be developed 'off-shore'. The project will support the extension of stably high yielding and adapted sorghum varieties.
- Farmers must be allowed to select the legumes of preference in a maize-legume intercropping or rotation system. Although cowpea features prominently in the control technologies being currently extended to farmers, its susceptibility to pests

and disease that necessitates spraying without which complete yield loss may occur, is a problem.

- The integration of livestock into the technologies being currently extended to farmers should be encouraged because all strategies that have the capability to improve soil fertility will ultimately impact positively on level of striga infestation as well as yield improvement under the parasite.
- Funds from the Korean government for the execution of the current project is NOT for research.
- The project aims at controlling striga in Africa, not to eradicate it. Any strategy aimed at eradicating striga from Africa is not only **overambitious, unscientific but also unrealistic**. This is because Africa is the Centre of Origin of striga, with many alternative wild hosts, in addition to food crop hosts. If striga does not reproduce on food crops, it will reproduce on the wild hosts, which in many cases grow on fields adjoining those planted to food crops, and thereafter re-infest crop fields.
- Subsequently, Prof. Kim will push on increased funding from the Korean government to about \$1 m. The basic understanding that got the Korean government committed to the program is that the technologies being promoted will not involve the use of chemicals and would be environment-friendly.
- Efforts need to be made to get the results of the on-farm demonstration published in scientific journals that are listed in the Science Citation Index (SCI). While the effort of Dr. Abdulahi in publishing results obtained in Ghana in a Pakistan journal is commendable, publishing in SCI journals should be prioritized.
- There should be timely submission of report, even if interim, to be able to secure regular funding for the project. The lateness in securing funds for the project in 2006 should be seen as an opportunity to test the sustainability of the project.
- The initiative to combat striga in Africa should translate to improved economy for African countries, given that maize is now a new source of energy, through the production of ethanol. For ethanol production, dent maize is most useful. Dent maize is also good for livestock. The environment for corn production is much better for West and Central Africa than in many parts of the world. Algeria is currently exploring sourcing water from between 200 to 1000 m depth to produce maize for ethanol production.

Reactions to Prof. Kim's presentation

Prof. S.T.O. Lagoke

- Gratitude is due to Prof. Soon Kwon Kim and the Korean government for their interest in Africa's economic development.

- The project is already generating impact.
- New materials continue to be developed and are being accepted by farmers. For example, farmers in Imeko, Southern Nigeria observed that ACR TZL, the STR variety being promoted for adoption, does not store well. This material has now been replaced and the new variety has been embraced by farmers.
- There is need for Prof. Kim to press for increased funding for the project to further scale-up.

N'tji Coulibaly

- Scientists in Africa would do their best for the success of the project and to improve the livelihood and conditions of African farmers.

Abdalla H. Mohommed

- In Sudan, maize has been grown since the 1990s, but only landraces are grown. How can Sudan benefit from the on-going project without trying to re-invent the wheel?

Prof. Soon Kwon Kim

- For lowland ecologies in Sudan, materials already developed for lowland ecologies in other countries can be used.

PROPOSED COUNTRY ACTIVITIES FOR 2007

Cameroon

Presentation by

Charles The

- Activities for the project in Cameroon are concentrated in the Northern Guinea and Sudan Savanna.
- In 2007, ten villages in the two ecologies will be involved; five of these have been involved in previous years while five are new.
- In 2007, the plan is to reach 1000 farmers
- Activities for 2007 have already commenced with two training sessions, the first involving 52 extension agents and the second on seed multiplication. For the latter training, farmers and sites have been selected. Farmers were taught strategies for isolation, rouging of off-types, importance and rates of fertilization and harvesting.
- Breeder seed production will also be carried out on-station.
- Technology demonstration will involve variety and rotation trials.
- The variety trials will involve two farmers per village in each of the ten villages. Rotation trials will also involve two farmers per village. A total of sixteen farmers will be involved in community seed production of intermediate, early and extra-early STR varieties. The community seed production is also being supported by FAO.
- Diffusion of STR varieties will involve the packaging and distribution of 2 kg seed of STR varieties to each farmer to be reached in the project.
- Two farmers' field days are planned. One is to take place on-station, while the other will take place on farmer's field. The on-station field day will afford farmers the opportunity of assessing materials not involved in the demonstration in their villages.
- The Cameroon team has prepared a two-page questionnaire for farmers to evaluate demonstrated technologies.
- In 2006, due to the lack of funds, activities mainly involved interaction with farmers involved in seed production which was carried out on an area of 50 m x 50 m per farmer.

- In 2006, based on previous arrangements, 20 bags of seeds of STR varieties were obtained from farmers as repayment for investment by the project on their seed production. A recurring problem is that farmers usually declare lower yield than obtained because of their intention to return less grain to the project.
- The cowpea used in the project (TVX 1850-01F), obtained from the Benin Republic Program, is not usually sprayed but still gives some yield.

Prof. Soon Kwon Kim's remarks

- The Cameroon Program appears to have recorded the most outstanding achievement. For seed multiplication, estimates of seed production by scientists should be used rather than what is declared by farmers.

Burkina Faso

Presentation by

Ouedraogo Oumar

- In 2006, seed production was carried out, and this involved 15 farmers, each producing seed on 0.25 ha of land. In all, seeds of two varieties were produced viz. ACR 97 TZL Comp 5 W and ACR 97 TZL TZL Comp 5 Y. A total of 4 tons of STR maize was produced; 3 tons of the yellow and 1 ton of the white.
- Without STR varieties, farmers prefer to produce sorghum and millet instead of maize.
- Average maize yield using STR maize varieties is 2 to 3 tons per hectare.
- In 2007, the national program will use its own funds to incorporate STR genes into non-STR materials.
- Superior performance of STR varieties over non-STR varieties will be demonstrated in farmers' fields infested with striga. Demonstration will be carried out in 7 villages
- Demonstration will consist of three plots, each 1000 m². In the first year, each of the three plots will be planted to (i) STR maize variety, (ii) cowpea trap crop, and (iii) local maize variety. In the second year, the plot planted to STR maize in the first year will be planted to cowpea, while the plot planted to cowpea in the first year will be planted to STR maize variety in the second year.

- Community seed production will be carried out on 2 ha for the production of seeds of two STR varieties. Seed of cowpea and soybean to be used for trap cropping will also be produced. Cowpea is usually sprayed in Burkina Faso because of its severe pest problem. INERA is currently developing NEEM seed extract to control cowpea pests and diseases, as a cheap and readily available alternative to expensive chemicals.
- Farmers will be taught the nitty-gritty of seed production

Prof. Soon Kwon Kim's Comments

- Introduced STR materials may originally come from IITA but these can be given local names if recombination of selected superior plants under striga has been done. Such materials may be better adapted than the original varieties from which they were derived.

Cote d'Ivoire

Presentation by

Louise Akanvou

- Cote d'Ivoire joined the program at inception, but was not able to continue due to the war.
- Before the disruption by the war, 4 to 5 maize varieties and legumes were being demonstrated. All the seeds kept in the store were completely lost, so activities would have to commence afresh.
- In 2006, through the AMS Project, seed increase was done.
- Foundation seed production would be done in 2007 and this will subsequently be stepped up to the community level.
- Plans are being made to recommence activities in 2008.

Prof. Soon Kwon Kim's Comments

- The war in Cote 'Ivoire should be seen positively in terms of helping to develop farmers' variety under his own local conditions and under striga. If properly carried out, farmers' varieties may even yield 5 to 10% higher than introduced varieties from which selections were carried out.

Ghana

Presentation by

Abdulahi Marshak

- A scientific article based on results obtained in the project in Ghana was published in Journal of Agronomy, based in Pakistan. Reprints of the articles would be made available to scientists involved in the project.
- The oil being extracted from soybean in Ghana is an incentive for its use in rotation.
- In 2006, the only activity carried out was the distribution of seeds to farmers for planting in striga-infested fields.
- New locations/villages will be used in 2007; commitment will be extracted from farmers to be part of the project for at least three years.
- The implementation of the project is being done in conjunction with the Ministry of Agriculture.
- Women participation in the project has been on the increase given that they are the ones using soybean. Currently, women participation in the project is 50%.
- Four plots are used for the trials; the first plot is usually planted to the farmer's variety, the second plot to STR maize variety, the third plot to STR maize and legume intercrop and the fourth plot to farmer's maize variety intercropped with legume.
- The experience in Ghana shows that tolerance to multiple stress is desirable; this is supported by the good performance of STR varieties under the drought that occurred in 2006.

Prof. Soon Kwon Kim's Comments

- Expenses incurred in the publication of scientific articles will be reimbursed by SAFGRAD. Efforts should, however, be made to publish in journals listed in Science Citation Index (SCI).
- It is important in all publications to acknowledge the Korean government as providing funds for the implementation of the project.

MALI

Presentation by

N'tji Coulibaly

- In 2006, two farmers' field days were organized to showcase the performance of STR materials, one in the north and the other in the south.
- Selection of outstanding varieties was done in conjunction with farmers; two varieties were selected in each of north and south.
- In 2007, demonstration will be carried out in ten locations with five farmers per location. The fifty demonstrations to be carried out will involve 30 demonstration trials of varieties and 20 demonstration trials of the effectiveness of intercropping. The demonstrations will be carried out in conspicuous locations in the two zones.
- Seed increase will also be carried out and a private seed company is being engaged in this activity for sustainability.
- Two farmers' field days are proposed for 2007 to bring together 500 farmers
- Radio and Television Stations will be invited for coverage and documentation.

Prof. Soon Kwon Kim's Comments

- Prof. Kim would like to encourage the development of national scientist. Varietal crosses can be made using IITA's STR materials and locally adapted materials, rather than relying on materials from IITA every year. This will encourage the development of seed companies who will provide improved seeds and market to farmers.

NIGERIA

Forest -Savanna Transition and Southern Guinea Savanna

Presentation by

Prof. S.T.O. Lagoke

- In 2006, activities were carried out in the Forest Savanna Transition Zone and the Southern Guinea Savanna.
- At Imeko, Forest Savanna Transition Zone, the activities carried out include the demonstration of the superior performance of improved STR varieties on farmers' fields, diffusion of proven technologies, awareness generation –especially for policy makers, and assessment of impact using questionnaire.
- At Imeko, rotation has replaced intercropping because the shade provided by maize offers an enabling environment for vertebrate pests that visit plots to destroy intercropped groundnut (Variety RLP 91).
- For diffusion, 30 farmers were each provided with 2 kg of seed.
- In 2006, farmers' field day was also carried out, with 120 farmers participating.
- ACR 97 TZL Comp 1 which farmers complained about as not storing well has been successfully replaced with farmers embracing the new variety which stores very well and supports fewer striga plants than the farmers' variety.
- In 2007, 26 farmers will be involved in the Southern Guinea Savanna; 14 around Mokwa and 12 in Bida.
- Given the new initiative to increase cassava production in Nigeria, cassava is being integrated in between the groundnut of one year and the next season's maize. Number of demonstrations without cassava would be 10 in Mokwa and 10 in Bida.
- In 2007 in the Forest Savanna Transition Zone, 20 new farmers will be added to those already participating in the project.
- In all, a total of 160 farmers will receive 1 kg of seed. The farmers will be drawn from Lanlate, Eruwa, Imeko, Odo Erin, Mokwa and Bida. No fertilizers will be given.

Prof. Soon Kwon Kim's Comments

- Farmers should not be over-pampered by providing them with seed of groundnut every year. Any serious farmer should be able to save some seeds from one year's planting for the following year since groundnut is a self-pollinated crop.

NIGERIA

Forest -Savanna Transition and Southern Guinea Savanna

Presentation by Ibrahim Kureh

- Two scientific papers have been written up on the work. One was submitted to a journal in ABU, Zaria while the other submitted to a journal in Asia has been accepted.
- A total of 26 demonstration trials have been planned for 2007, 12 in the Sudan Savanna and 24 in the Guinea Savanna
- In the Sudan Savanna, early maturing STR maize ready for harvesting in 60 days will be used in rotation with cowpea, while for the Guinea Savanna, ACR 97 TZL Comp 1-W will be grown in rotation with soybean TGX 1448-2E.
- Farmers' groups are relied upon and discussions on demonstration are done with leaders of such groups.
- Demonstrations would be carried out on three plots of 20 m x 20 m. One plot will be planted to the STR maize variety, the second to a legume and the third to the farmers' maize variety in the first year while crops in the first and second plots will be rotated. The third plot will be cropped to continuously to the farmers' variety.
- On-station, seed multiplication of STR maize varieties and legumes will be carried out. Premier Seed (a seed company) has been invited as a partner in the seed production and is expected to take some responsibilities to ensure sustainability in the near future.
- Socio-economic impact assessment is being planned for areas where the project has been executed for at least 3 years.

Prof. Soon Kwon Kim's Comments

- Attempts should be made to extend the trials to Bauchi and Maiduguri. Although the limited funds may be a constraint, synergy among projects should be exploited

and this can be achieved, in this instance, by linking up with the Doubling Maize Project initiative currently going on in Nigeria.

- It is a welcome development bringing in Premier Seed into the project, given that hybrids may be better in the Savanna, and a seed company is likely to be more effective in filling the gap in seed supply.

Benin Republic

Presentation by

Gualbert Gbehounou

- Community seed growers for the tested and proven maize varieties have been identified in the 14 districts in the northern part of Benin. The STR varieties to be grown are ACR 94 TZE Comp 5-W and ACR 97 TZL Comp 1-W.
- An extension map of the varieties was produced in 2006
- In 2006, farmers' field schools were organized.
- Given the importance of sorghum in northern Benin, the crop has been introduced into the intercropping system involving legumes. Sorghum varieties introduced were farmers' varieties.
- In 2007, farmers' field school activities would be continued. Four field schools are being planned; two on maize and the remaining two on sorghum.
- Field visit by farmers (during farmers' field days) is not the same as field schools. Farmers participating in field schools teach farmers on field visits.
- Plans are underway to introduce soybean into the intercropping system since cowpea can be attacked by *Striga gesnerioides*.
- Attempts are being made to involve women in striga control activities because they inherit the poor soils which are used to grow sorghum and millet. Men, on the other hand, cultivate the more fertile soils which generate substantial income.

Prof. Soon Kwon Kim's Comments

- Whichever crop is considered, it is important to concentrate on genotypes not requiring chemicals.
- With respect to sorghum varieties, consideration must be given to other uses to which farmers put the stalk. Short varieties have never been popular because farmers use the stalk for fencing.
- The leaf extract of *Hyptis suaveolens* has potential for use in controlling pests and has been successfully used to control mosquito.

NIGER

- Fatouma Seyni indicated Niger's eagerness to join the project

Prof. Soon Kwon Kim's Comments

- Niger Republic can take 2 kg each of 2 to 3 STR varieties from Burkina Faso for initial demonstration since the two countries have similar ecological conditions.
- Selection can be made on the materials collected from Burkina Faso.

SUDAN

- Abdalla H. Mohamed indicated Sudan's eagerness to join the project.
- Artificially infested fields are available in Niger for initial testing.
- Much of the work on striga in Sudan has been on sorghum and Desmodium.

Prof. Soon Kwon Kim's Comments

- Sudan can also take 2 kg each of 2 to 3 STR varieties from Burkina Faso for initial demonstration since the two countries have similar ecological conditions. Even if more seeds are required, it should be possible for SAFGRAD to pay for such.
- It should be possible to explore maize and desmodium for striga control.

Overview of Practices and Lessons Learned in Striga Control

Charles The

- It is important to continue to use varieties appropriate for ecological zone in terms of maturity group.
- Scientists in the various countries should endeavour to meet up with the schedule for submission of reports for timely preparation of annual reports to be able to secure funding.

Victor O. Adetimirin

- There is need to arrange for newly participating countries to visit on-farm demonstration in countries that have good trials in 2007.
- Farmers reached through the project should include those who participated in the farmers' field day as well as those who benefited from distributed seed packages.
- New countries joining the project should take reports of the demonstration trials over the years to familiarize themselves with the approach and strategies used in the project.
- Arrangement is being made to get two papers on the project published. One would be an overview of the project and the strategies employed. The other would contain empirical data of impact generated. The draft of the first paper should be ready within four months of the planning meeting (i.e. October)

Prof. Soon Kwon Kim

- For mid-altitude areas as found in Zambia, crosses can be made between lowland STR materials and mid-altitude adapted materials for the development of varietal crosses that are tolerant and resistant to striga. Mid altitude areas in Ethiopia can use the initiatives already suggested for Zambia.
- Team work is very important for new comers, even if such people have limited knowledge on striga.
- An award can be given to the country with the best demonstration.
- Countries with the worst demonstration can be dropped to be able to concentrate on more serious ones.
- The consultants need to carry out initial tour to determine which countries with good trials the new participating countries should visit during the 2007 monitoring tour.

- Each country should submit a small report of the activity that it undertook in 2006 when funding was not secured from the Korean government. Deadline for submission to SAFGRAD was fixed for 15 July 2007.

Work Plan for 2007/2008

The following work plan was approved for implementation for the year 2007/2008:

1. Implementation of country projects; June 2007-December 2007.
2. Submission of project request to Korean Government: 31 August 2007
3. Monitoring tour: Mid September to October 2007 (when striga emergence and attack are apparent in most countries).
4. Submission of country yearly reports (including photographs and other illustrations) to SAFGRAD Coordination Office: 15 January 2008.
5. Submission of project annual report and monitoring tour report to the Korean Embassy: 31 January 2008
6. Review and Planning Meeting: First week of February 2008.
7. Submission of financial justification to SAGFRAD: 31 March 2008

Participants at the meeting involving countries already participating and those joining the on-farm demonstration of striga control technologies held on Friday 22 June 2007 at AU-SAFGRAD Office, Ouagadougou, Burkina-Faso

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