West and Central Africa Maize Network (WECAMAN)

Proceedings

of the
Fifth Meeting of the Steering Committee

held
24-25 April, 1996

Cotonou, Benin

CONTENTS

1.0 OPENING SESSION

The opening session of the fifth meeting of the Steering Committee of WECAMAN started with the registration of participants. Shortly after, the formal opening ceremony took place at IITA-Benin, Cotonou.

The opening session was addressed by Dr F. M. Quin, the Director of the Crop Improvement Division (CID) of IITA; Dr Ouedraogo Mahama, representing OAU/STRC, Dr S.K. Reddy, REDSO, Abidjan; and Dr M. Houssou, the Director of Agronomic Research of Benin.

1.1 Welcome address by the Chairperson

The chairperson for the opening ceremony was Mr D. J. Monhouanou who is also the chairman of the Steering Committee of WECAMAN. Mr Monhouanou welcomed all participants to the fifth meeting of the Steering Committee and expressed his gratitude to IITA for hosting the fifth meeting of the Steering Committee at the Calavi Station in Cotonou, Benin. Finally, the Chairman wished all participants fruitful deliberations.

1.2 Opening Remarks by the Director of the Crop Improvement Division of IITA

The Director of CID, Dr F. M. Quin who is also a member of the WECAMAN ad hoc Research Committee expressed great pleasure to be at the fifth meeting of the Steering Committee of perhaps the most important commodity network in West and Central Africa. Dr Quin pointed out that WECAMAN is perceived as the most successful of the commodity networks because of its clear strategies to develop, transfer and disseminate appropriate maize technologies in the sub-region. IITA, therefore places great importance on the maize network as it forms a vital link between the NARS and the international research system. Dr Quin noted with satisfaction the continuous evolution of the maize network to better cope with the challenging problems associated with maize production and utilization in West and Central Africa. Dr Quin, therefore looked forward to interesting discussions during the meeting.

1.3 Opening remarks by the International Coordinator of OAU/STRC

The International Coordinator of OAU/STRC was represented at the meeting by Dr Ouedraogo. In his remarks he noted with satisfaction the support that is being given by WECAMAN to small-scale farmers in seeking solutions to many challenges of maize production in the sub-region. Dr Ouedraogo also noted that although the maize network has achieved a lot, there are still several serious problems which confront producers and consumers in the sub-region.

He wished the participants fruitful discussions and pledged the continuous support of SAFGRAD for the maize network.

1.4 Openings remarks by the USAID Representative (Dr S. K. Reddy)

The USAID representative, Dr S.K. Reddy commended the network for its good management, ownership by NARS, the good technical assistance from IITA and the well conceived technology transfer program.

He advised that during the discussion of the budget, the Steering Committee should bear in mind the issue of financial sustainability of the network and seek ways and means for ensuring that the respective governments and donors would work towards this goal.

Dr S. K. Reddy also commended the ad hoc Research Committee for its devotion and for ensuring the high quality research. He finally extended his encouragement and appreciation for the good work of the Network Coordinator.

1.5 Opening address by the Director of Agronomic Research of Benin (Dr M. Houssou)

In his remarks, Dr Houssou, the Director of the Agronomic Research of Benin, welcomed the participants to Benin and thanked the organizers for choosing Benin as the venue for the meeting. He expressed his appreciation for WECAMAN for tackling the important constraints of maize production in the sub-region. He called on the network to find ways of improving the overall food security of the sub-region by looking beyond the production aspects.

Dr Houssou also called for the network to seek ways of harmonizing maize research activities in order to avoid duplication of efforts among the different partners working on maize such as CORAF, IITA, RRPMC.

Finally Dr Houssou expressed his gratitude to USAID for funding the network activities and declared opened the 5th meeting of the WECAMAN Steering Committee.

1.6 Attendance

The meting was attended by the Steering Committee members from Cameroon, Ghana, Côte d'Ivoire, Burkina Faso, Togo, Mali and Benin. The Steering Committee member from Nigeria was not able to attend the meeting. Representatives of IITA, OAU/STR SAFGRAD, CIMMYT-CI and USAID were also present at the meeting. The full list of participants is attached as the appendix I of this report.

1.7 Agenda

The proposed agenda was modified slightly to allow participating scientist from IITA and CIMMYT-CI to present progress reports on their research programs.

The agenda was adopted following this modification. The agenda of the meeting is attached

as the appendix 2 of this report.

2.0 PRESENTATION OF THE COORDINATOR'S REPORT

The Coordinator's report which was presented by Dr B. Badu-Apraku covered the period January-April, 1996. The report was presented under the following headings:

2.1 Management of the Maize Network

2.1.1 Development of extension manuals

In an effort to promote technology transfer in WECAMAN member countries, prototype extension manuals for each member country of WECAMAN were prepared during the workshop on the development of extension materials held in Kumasi, Ghana from 9-13 October, 1995. The Steering Committee decided that member countries should adapt the prototype extension manuals to the local conditions and submit them to the IITA Materials Development Unit through the Coordinator for final editing and publication. So far revised manuals had been received from only Togo and had been forwarded to the IITA Materials Development Unit for the appropriate action.

2.1.2 Ownership and statutes of WECAMAN

At the request of the Steering Committee of WECAMAN, the brochure on the network statutes had been updated and the English and French translations had been prepared for distribution to members.

2.1.3 Symposium on developing drought and Low- N tolerant maize

At the invitation of CIMMYT, the Network Coordinator participated in the symposium on developing drought and Low-N tolerant maize in CIMMYT, Mexico from March 23 - 30 March, 1996. During the meeting, the Coordinator presented a paper entitled "Progress in breeding for drought tolerance in tropical early maturing maize for the semi-arid zone of West and Central Africa". Also, the Coordinator was appointed to serve as the leader of a small discussion group to consider how CIMMYT and the national programs in West and Central Africa together can improve the performance of maize growing under stress conditions in the low land tropics in farmers' fields.

2.1.4 Publications

Proceedings of the fourth meeting of the WECAMAN Steering Committee and the results of the 1995 Regional Trials as well as the 1994/95 Annual Reports were published in both English and French and distributed to network member countries and USAID.

2.2 The third meeting of the ad hoc Research Committee of WECAMAN

The Steering Committee of WECAMAN during its fourth meeting held in IITA-Ibadan from 13 - 16 November 1995, decided to extend the term of office of the ad hoc Research Committee for one more year. Also, it was decided that new collaborative research proposals covering the period 1996 - 1998 as well as the progress reports on the 1995 collaborative research projects should be submitted to the ad hoc Research Committee by all member countries. Following these decisions, the format for preparing the proposals were sent to the Steering Committee members of each country for distribution to fellow scientists.

The response was very encouraging and collaborative research proposals, progress reports as well as justifications for 1995 funds had been received from almost all member countries. A meeting of the ad hoc Research Committee was held from 9-11 April, 1996 in Abidjan to review the proposals and progress reports, assign research responsibilities and allocate funds.

2.3 Advanced computer course for breeders and agronomists

An advanced computer course for breeders and agronomists would be organized by WECAMAN in collaboration with the Group Training and the Biometrics Units of IITA from 11 - 21 June, 1996. The course had been designed to upgrade the skills of national scientists in the analysis and interpretation of complex statistical data, selection of appropriate statistical methods for data analysis and in the use of a major statistical package independently Following the request for nominations from member countries of WECAMAN, two participants (an agronomist and a breeder) had been proposed by each country. Also slots had been allocated to three participants to be sponsored by the West and Central Africa Sorghum Network as well as some participants from non-member countries. The list of candidates accepted for the course is shown in Table 1.

2.4 Technician training course

Following the request for nominations for the technician training course planned for Ferkéssédougou from July to November 1996, one technician had been nominated by each member country. The list of the nominees for the course is presented in Table 2.

Table 1. **List of the nominees for the advanced computer course for breeders and agronomists**

Name	Country	Qualification
1. Hema Idrissa	Burkina Faso	Breeder
2. Zoure Honorat	Burkina Faso	Agronomist
3. Abdoulaye Kamara	Mali	Agronomist
4. Cheick O. Kéita	Mali	Breeder
5. Cherno Bujang*	Gambia	
6. Jalloh Adbulai*	Sierra Leone	
7. E.N.O. Iwuafor*	Nigeria	Agronomist
8. K. A. Elemo*	Nigeria	Agronomist
9. A. A. Adeoti	Nigeria	
10. René Akanvou	Côte d'Ivoire	Seed technologist
11. Attiey Koffi	Côte d'Ivoire	Breeder
12 Essey-Yovo Mawulé	Togo	Breeder
13 Edah Komi	Togo	Breeder
14 Kingsley Osei**	Ghana	Breeder
15 Naab J. Bonaventure	Ghana	Soil scientist

* Sponsored by the Sorghum Network
** Sponsored by Ghana

Table 2. List of candidates nominated for the WECAMAN technician training course

Name	Country
1. Yameogo Paul	Burkina Faso
2. Titus Ochibe	Nigeria
3. Abdoulaye Cissé	Mali
4. Lare Tchenliak	Togo
5. Mawunya Michael	Ghana
6. Ms Allah Amoin Virginie	Côte d'Ivoire

2.5 Monitoring tour to Ghana and Burkina Faso

A monitoring tour would be conducted to Burkina Faso and Ghana between late August and the first week of September, 1996. The tour would cover all aspects of maize research, extension and production systems of each country. The objectives of the tour are to:

- discuss maize production constraints of the two countries
- discuss research being conducted and methodologies used to solve the problems relating to maize production: how research, extension and production are organized in the countries and the linkages which are in place between research and extension to facilitate technology development and transfer.
- provide a forum for interaction among national scientists on issues relating to maize research, extension and production.
- monitor collaborative research projects funded by WECAMAN in the two countries.

2.6 Resident research of the Network Coordinator

The major activities in the resident research program included the planting of the 1996 dry season nursery and processing of seed. The breeding nursery involving the early and extra-early materials had been established in Ferkéssédougou under irrigation . The four

breeding populations in the resident research program TZEE-Y Pop, TZEE-W Pop, TZE-W Pop and TZEY-Pop were all being taken through the fourth cycle of improvement.

2.7 1995 Regional Uniform Variety Trials

Two types of Regional Uniform Variety Trials (RUVT) were offered in 1995 to collaborators in West and Central Africa. These included:

- RUVT-Early: Early maturing varieties flowering in about 49 days after planting and producing dry grains in 90-95 days.
- RUVT-Extra-early: Extra-early maturing varieties flowering in 40-45 days after planting and producing dry grains in about 80 days.

A total of 57 sets of RUVT were sent to 13 countries in West and Central Africa in 1995 (Table 4). As at the end of March, 1996, data had been received for 44 sets from 11 countries, giving a recovery rate of 86 %. No data were returned by Mali and Sierra Leone.

Table 3. List of participants proposed for the 1996 monitoring tour to Ghana

Name	Country	Qualification
1. Kambou Georges	Burkina Faso	Eco-Toxicologist
2. E.N.O. Iwuafor	Nigeria	Agronomist
3. Anguete Kouame	Côte d'Ivoire	Seed technologist
4. N'Tji Coulibaly	Mali	Agronomist
5. Biliwa Alona	Togo	Post-harvest specialist
6. A. L. Nyamekye	Ghana	Soil scientist
7. Titus Ngoumou Nga	Cameroon	Agronomist
8. Gbehounou	Benin	Agronomist

Table 4. Number of sets of Regional Uniform Variety Trials (RUVT) dispatched to both member and non-member countries of the Maize Network in 1995 and the recovery rate

Country	Number of trials requested		
	RUVT-early	RUVT-extra-early	Total
Benin	3	3	6
Burkina Faso	3	3	6
Cameroon	3	3	6
Côte d'Ivoire	2	2	4
Gambia	2	2	4
Ghana	3	3	6
Guinea	3	-	3
Mali	2	3	5
Nigeria	5	3	8
Senegal	2	2	4
Sierra Leone	2	2	4
Togo	2	2	4
Total returned	25	24	49
Total dispatched	30	27	57
Recovery rate (%)	83	89	86

2.8 Discussion of the Coordinator's report

Several issues were discussed by the Steering Committee following the presentation of the Coordinator's report. On the problem of providing more geographical information on the various locations used for testing early and extra-early maize varieties, Dr Quin offered to

obtain an appropriate geopositioning instrument to accomplish this. Complete description of the test sites is necessary to permit a more useful interpretation of the data on the varieties in both short-and long-term.

The issue of the same scientists participating in every WECAMAN activity in several countries was discussed at length. The Steering Committee was of the view that this practice by several national programs was not in the interest of the network, since it would, in the long-run negate efforts towards sustainability of network activities. The Steering Committee therefore appealed to the Directors of Research in all network member countries to use their good offices to ensure the participation of all maize scientists in WECAMAN activities as much as possible.

Nominations of participants for the training courses as well as for the monitoring tour had not been received from Benin and Cameroon. Steering Committee members from the two countries were asked to bring this delay to the notice of the Directors of research of each country.

3.0 PRESENTATION OF THE AD HOC RESEARCH COMMITTEE REPORT (By Dr F. M. Quin)

The report of the third meeting of the ad hoc Research Committee of WECAMAN was presented by Dr F. M. Quin. The main points of the report were as follows:

(i) Although there were some problem areas, in general network members had achieved a high standard in the presentation of progress reports for 1995 and project proposals for funding in 1996.

(ii) A distinct change was evident in the project proposals when comparing 1995 with 1996. Key aspects of this were that there was much more attention to maize agronomy and cultural/biological control of *Striga*, and less emphasis on breeding. The effect of this, was that the network no longer could be accused of giving too much attention to breeding while neglecting the other areas of research and technology development. It was clear that the research activities were now multidisciplinary and were concerned with all aspects of the maize production system, including postharvest. In addition, breeding efforts are more obviously problem or need oriented e.g. *Striga* resistance/ tolerance, grain quality characteristics, drought tolerance.

(iii) In 1994 and 1995, the committee had made certain criticisms on the reports and proposals and had given guidelines on how the standard could be improved. It was gratifying to note how network members had responded to these recommendations leading to substantial improvements in the 1996 submissions.

(iv) The committee had queried some technical points in some of the individual project submissions. These would be passed back to the network members. In cases where

certain revisions were recommended in trial design or other aspects of a proposal, the committee hoped the country concerned would make the requiered adjustments.

(v) With respect to the projects, the committee recommended that attention should be given to the background information on the proposed activities in a more focussed way. In 1994, when proposals were submitted, it was understandable that the background information for the work proposedSwas rather general. Now that certain activities had been in progress for two years, the background information should present the progress made which then provides the context and justification for the new work that was being proposed.

(vi) Certain topics in the networks research agenda, could be reported on a regional basis by drawing together the results of work undertaken in individual countries. One such topic is the trial conducted on the use of ground pods of *Parkia biglobosa* for *Striga* control. The committee recommended that this trial should be repeated (with more levels of treatments) by one member country (Burkina Faso) and then all the results obtained in 1995 and 1996 should be written up as a single report on this topic.

Discussion of the report of the ad hoc Research Committee of WECAMAN

The Steering Committee was unanimous in commending the ad hoc Research Committee for their dedication to the network and for the excellent job of reviewing the progress reports and the new project proposals as well as allocating funds for new collaborative research projects. The Steering Committee was aware of the enormous efforts required to review eight progress reports and 55 research proposals and expressed gratitude to the three members of the committee for a difficult job well done at a short notice.

On the question of why Nigeria did not submit a proposal on Project 5, the Coordinator explained that funds were provided to support project 5 in Nigeria in 1995 but the project was not executed. Nigeria was therefore expected to use the 1995 funds to implement the project in 1996.

Finally, the committee noted that several proposals were rejected not because they were not good but because of fund limitations. If funds were available most of these proposals would have been funded.

4.0 PROGRESS REPORTS ON COLLABORATIVE RESEARCH PROJECTS FUNDED IN 1995

4.1 Progress reports on collaborative maize research projects in Ghana in 1995 by P.Y. K. Sallah, S. Twumasi-Afriyie & K. Boa-Amponsem

INTRODUCTION

The collaborative research projects funded by the Network in Ghana in 1995 were:

1. Breeding disease resistant intermediate maturing (110 days to maturity) maize varieties.

2. Breeding for drought tolerant and disease resistant early maturing (90-95 days) maize varieties.

3. Development of improved packages for integrated control of *Striga* in maize.

WECAMAN provided a total of US$11,500.00 to support these projects in Ghana during 1995.

PROJECT I: Breeding for Disease Resistant Intermediate Maturing maize Varieties.

Background

Two endosperm types of intermediate maturing maize populations have been developed by the Ghana Maize Program as sources of improved varieties. The endosperm types are intermediate normal and intermediate quality protein maize (QPM). The breeding populations are 105-day white dent population (normal endosperm), GH 8363 SR (white QPM) and EV 8766 SR BC6 (yellow QPM).

The objectives of this project are to (i) improve these populations for yield, disease resistance and other important agronomic traits, and (ii) develop high yielding and disease resistant varieties that mature in 105-110 days from the improved cycles of the populations for commercial production in the Guinea savanna zone.

Research activities carried out in each population were as follows:

Improvement of 105-Day White Dent SR Population (GH 105-DWD POP)

The 105-day white dent gene pool was developed using the best germplasm identified through international variety testing. The pool had been improved for ten cycles through half-sib selection in isolation. The superior fraction of the pool was extracted in 1991 to form two location-specific experimental varieties.

In 1994, a program was initiated to introduce the superioSwfraction of the pool into the 105-day white dent population to broaden the genetic base. A total of 140 reciprocal full-sib progenies (40 from the pool, 60 from the 105-day population and 40 from the pool x population cross) were derived from the two sources.

In 1995, 140 progenies and checks (Abeleehi, Obatanpa, the pool and population per se) were evaluated in 12 x 12 lattice with 2 replications at Nyankpala and Damongo, both in the Guinea savanna, at Fumesua in the forest zone and at Ejura in the transition zone. Families were rated for agronomic desirability based on visual family assessment of plant vigor, standability, uniformity of ears, and freedom from pest and diseases. Data were also recorded on days to 50% silking, plant and ear heights, grain yield, lodging and disease reaction.

The overall mean yield was 3.6 ton/ha compared to 4.4 ton/ha for the best 10 families. Mean grain yield of the four checks was 2.2 ton/ha. Mean days to 50% silk emergence, plant height, % root lodging and % stalk lodging were 54 days, 165 cm, 16.4% and 15.7% for the 10 top families, respectively. The top 10 families will be used to form an experimental variety. The best 40 families were also selected and these families had a mean grain yield of 4.2 ton/ha. The top 40 families will be recombined to form C_2 of improvement.

Improvement of intermediate white QPM population - GH 8363 SR

GH 8363 SR, a semi-flint white population, is the source of the QPM variety named Obatanpa which was released in Ghana in 1992. The population is under improvement for yield, disease resistance and high levels of lysine and tryptophan. A biochemistry laboratory has been set up at Fumesua to support the QPM program.

In 1994, 72 S_4 lines from the population were advanced to S_5. These lines were selected based on visual agronomic assessment and laboratory analysis for high lysine and tryptophan level at the S_1 stage. Topcross progenies involving these lines (S_3's) and two QPM heterotic groups from CIMMYT were evaluated at Kwadaso, Kpeve and Ejura in 1994.

In 1995, 72 S_5 lines were analyzed for tryptophan/lysine levels. Superior 30 S_5 lines were selected based on the topcross data and the biochemical analysis. Selected S_5 lines will be recombined to represent an improved version of the population.

Development of intermediate yellow QPM population - EV 8766 SR BC_6

EV 8766 SR BC_6 is a yellow streak resistant QPM variety obtained from IITA. However, it is segregating for grain color - yellow, white and pale yellow. It is being improved for yield, husk cover, protein quality and the desirable yellow color. The material has undergone three generations of selfing and selection for these traits.

In 1994, selected S_3 lines were recombined to form an improved version of the population. Full-sib families were generated from the population during the 1995 off-season for multi-location testing in 1996. The objective is to derive from the population a variety which combines high yield with high quality protein.

PROJECT 2: Breeding for Drought Tolerant and Disease Resistant Early Maturing (90 - 95 days) Maize Varieties.

Background

Two breeding populations, namely the 90-day white dent and the 90-day yellow flint/dent populations, have been developed for improvement as sources of early maize varieties in the national maize breeding program.

The objective of this project are to (i) broaden the genetic base and to improve these populations for yield, disease and drought tolerance, (ii) develop experimental varieties which combine earliness with high yield, disease resistance and tolerance to drought stress, and (iii) evaluate these varieties in national and regional maize variety trials in order to identify Swperior varieties for release for commercial production in Ghana as well as in the sub-region. Activities carried out so far were as follows:

Improvement of 90-Day White Dent Population

One hundred and forty-one full-sib families extracted from the 90-day white dent population and three checks were evaluated in replicated field trials at Nyankpala, Ejura and Fumesua in 1991. The top performing families selected at Ejura and Fumesua were recombined to form an experimental variety for each location in 1992. The top 20% of the families were also recombined for further improvement.

To initiate another cycle of selection and to introgress drought tolerance into the population, a total of 196 reciprocal full-sib families were generated from the following populations during the 1994 minor season at Fumesua:

- NAES Pool 16 DT (50 families). This material was selected from Pool 16 SR for earliness and tolerance to drought at Nyankpala through the IITA/SAFGRAD IPTT-DROUGHT trial conducted in 1990.
- NAES Pool 16 DT x 90-day white dent population (42 families).
- 90-day white dent population (100 families).

The three source materials were planted in mid-October under controlled irrigation which permitted the selection for moisture/heat stress during the generation of the full-sib families. Vigorous plants which showed minimal leaf rolling and good pollen-silk synchrony were selected and plant-to-plant reciprocal crosses were made. At harvest, plants with good standability and ear set were selected.

In 1995, the full-sibs and four checks (Dorke SR, NAES Pool 16 DT, Kawanzie and the 90-day white dent population) were tested at Nyankpala, Damongo, Ejura and Kpeve using a 14 x 14 simple lattice with 2 replications per site. In addition, seed increases of each family were made by sibbing to maintain adequate seed stocks for drought and MSV screening. Families were rated for agronomic desirability, uniformity of ears and freedom from pests and diseases. Data were also recorded on days to 50% silking, days to 50% pollen shed, plant and ear heights, grain yield, lodging and disease reaction.

The families in the progeny trial were also screened for tolerance to moisture stress in a drought nursery at Fumesua in the 1995 minor season. Two replications of the families and checks were planted late, replicate one on September 22 and replicate 2 on September 29, 1995. The drought period coincided with the grain filling period in the first replicate and flowering in the second replicate. Families were rated for tolerance to drought stress using a 1-9 scale, with 1= all plants within the family showing high level of tolerance and 9= all plants showing high level of susceptibility to moisture stress. The traits considered in the rating were leaf rolling, pre-mature leaf/plant senescence, anthesis-silking interval, ear size and seed set. The program to screen the families for MSV resistance could not be carried out because the irrigation facility at Fumesua was being over-hauled and has only recently become operational.

Data obtained from the field evaluation and the drought nursery were used to select 10 best families. Mean grain yield of the best 10 families was 7.2 ton/ha compared with 4.5 ton/ha for the four checks. Drought stress ratings on 1-9 scale showed that the selected families had a mean score of 4.9 while the check varieties had a mean of 5.5. The best 10 families will be used to form an experimental variety. Forty superior families were also selected for recombination to reconstitute the population for ourther improvement.

PROJECT 4: Development of Improved Packages for Integrated control of *Striga* in maize

Background

Striga spp. are important parasitic weeds of maize in the Guinea and Sudan savanna zones. Current research efforts in Ghana aim at developing resistant/ tolerant maize varieties as well as crop husbandry practices which will reduce the damage caused by *Striga* on maize.

The objectives of this project are to (i) identify sources of genetic resistance/ tolerance to *Striga* and to incorporate resistance into commercial varieties, (ii) develop appropriate cultural practices to control *Striga*, and (iii) develop and promote integrated *Striga* control measures that are effective, environmentally friendly and economically sound to the resource-poor farmer.

Development of Striga Resistant/Tolerant Maize Varieties

Striga hermonthica seeds collected from farmers' fields in previous seasons were used to develop an artificial *Striga*-sick field for screening germplasm for resistance/tolerance to *Striga* at Chanayilli near Nyankpala. The design used was a RBC in split-plot arrangement. *Striga hermonthica* levels (infested, uninfested) were the main plots and varieties or lines in the split-plots. Each maize hill in the infested plots received approximately 2,500 *Striga* seeds.

The following studies were conducted in 1995 using the *Striga* sick-plots:

1. Evaluation of Ghana Maize Inbred Lines for *Striga* Tolerance/Resistance (STR): This trial involved 20 homozygous lines comprising 9 QPM lines, 10 normal maize lines and IITA line 1368 as a check in 3 replicates.
   Grain yields for the lines under *Striga* infestation ranged from 2.2 ton/ha for 1368 to 0.1 ton/ha for GH 6. Promising *Striga* tolerant lines identified from the trial included ENT 70H (QPM), GH 4, GH 5 and GH 24.

2. Evaluation of Ghana Maize Hybrids for STR: This trial involved 5 normal maize and 6 QPM 3-way hybrids with Abeleehi, Obatanpa and Okomasa as the checks. Mean grain yields for the hybrids under *Striga* ranged from 2.0 to 3.4 ton/ha and 2.2 to 3.8 ton/ha without *Striga* infestation. Means for the three composites ranged from 1.5 to 2.4 ton/ha under *Striga* infestation and 1.6 to 2.3 ton/ha without *Striga* infestation. Promising STR hybrids in the trial were GH110-28, GH110-88, GH132-28 (all QPM) and GH22x1368x5012, GH20x1368x5012 (both normal maize).

3. Screening Irradiated Maize Populations (S_1's) for STR: Ten to 20 S_1 lines derived from each of 5 irradiated (200 and 300 GY) maize populations were screened under *Striga* pressure. Five to 8 lines were selected for further testing.

4. Development of STR Maize Population: The following materials were composited to form a population for improvement for STR: 120-Day White Dent Male Pop, New STR Syn-W, 9022-13, 9021-18, ACR 92 TZE COMP 5-W and ACR 93 TZL COMP 1-W. All STR materials used were identified through our STR screening program and were used as females with GH 120-Day Male Pop as the pollen source.

5. IITA STR Preliminary open-pollinated (intermediate to late) Maize Variety Trial: This trial comprised 30 intermediate-late composites with Okomasa and Abeleehi as the local checks. Grain yield was extremely low for all varieties with or without *Striga* infestation. The low yields were attributed to negative effects of continuous cropping of maize in these plots since 1991. The promising varieties identified were ACR 93 STR-W/Y and ACR 93 POP 49 STR-A.

6. IITA STR Inbred Trial: The trial consisted of 15 entries in four replicates. The trial

was abandoned because of poor germination.

7. IITA STR Hybrid Trial: The trial comprised 17 entries including P23 X P28 and ENT132 X P28, both QPM hybrids as local checks in 4 replicates. Grain yield ranged from 3.1 to 1.7 ton/ha under *Striga* and 3.7 to 2.4 ton/ha without *Striga* infestation. The promising STR hybrids included 9143-13, 9147-3 and 9145-11.

8. IITA STR Early Open-pollinated Maize Trial: This trial comprised 16 early varieties with Dorke SR as the local check. Grain yields were again very low in the trial and ranged from 1.9 to 1.1 ton/ha under *Striga* and 2.1 to 1.6 ton/ha without *Striga* infestation. There was very little difference between the varieties in terms of grain yield with and without *Striga* infestation.

9. IITA STR OP Maize Variety Trial: The trial consisted of 11 entries with Abeleehi as the local check. There was little difference among the varieties in terms of grain yield even without *Striga* infestation. Hybrid 9022-13 was rated the best entry in terms of *Striga* resistance.

Agronomic Research for Control of Striga

The following studies were conducted in farmers' fields under natural *Striga* infestation in 1995:

1. The study on the effect of brine seed treatment on the incidence of Striga in maize was established at 4 sites. Treatments were 0, 0.5, 1.0, 1.5 and 2.0 molar NaCl solution. Maize seeds were soaked in brine solution 24 hours before sowing. Grain yield ranged from 2.5 ton/ha for the control to 1.9 ton/ha for 2.0 M treatment. No significant effect of brine seed treatment was observed on *Striga* incidence in maize or on Swize grain yield.

2. The study on the effect of *Mucuna* on *Striga* control and the yield of succeeding maize crop was established at 10 sites. The treatments were (1) continuous maize, (2) maize-mucuna relay in which maize was planted first, followed by *Mucuna* 4-5 weeks after, and (3) Maize-*Mucuna* rotation. The study was initiated in 1995 and no results were yet available.

3. The study on the effect of crop rotation and intercropping systems on *Striga* control was planted at 5 sites. Continuous maize was the control, while maize in rotation with groundnut, soybean, cotton and maize intercropped with groundnut and soybeans were the treatments. In 1995, the maize was established in all plots to assess the treatment effects on *Striga* incidence in maize. Mean grain yield across all treatments was 1.8 ton/ha. No significant differences were observed between cropping practices in terms of *Striga* population at tasseling or at harvest and maize grain yield.

4. The treatments used in the study on the effects of *Parkia biglobosa* pod on *Striga* incidence in maize were (1) control and (2) milled *Parkia* pods at 50 g per maize hill of 2 plants. The trial was established at one location on-farm and under natural *Striga* infestation on-station. There were 4 replicates at each site.

Visual observation showed that maize plants in *Parkia* treated plots were greener compared to the control. However, there was little effect of *Parkia* on *Striga* incidence and severity in maize.

4.2 Progress Reports on Collaborative Research Project funded in Cameroon by Dr T. Ngoumou Nga

Six collaborative research projects were implemented in Cameroon in 1995. These included:

1. Project 3: Breeding for disease resistant extra-early maize maturing varieties.
2. Project 1: Breeding for disease resistant intermediate maturing maize varieties.
3. Project 4: *Striga* control
4. Project 5: Effect of legume improved fallow on the performance of on-farm maize varieties.
5. Project 7: Promotion of on-farm level seed production.
6. Project 8: Effects of *Parkia biglobosa* pod on *Striga* incidence in maize

PROJECT 3: Breeding for disease resistant extra-early maturing varieties (80-85) days to maturity

The 1995 activities included:

- Evaluation of F_3 variety crosses
- Mass selection within selected variety crosses for earliness and color separation.

F_3 Evaluation: IRA -EVT Extra-Early

This trial comprised 7 crosses made with selected extra-early and early parents. The trial also included 2 CIMMYT entries, 2 extra-early checks, CSP-SR and TZEE-W-SR, and 1 local check CMS 9015.

The parents used for the crosses included: TZEE-W-SR, CSP-SR, FBC_6, MAKA-SR and BDP SR. The F_3 crosses evaluated in 1995 were selected from 1994 F_2 trials.

The best extra-early varieties were CSP-SR x TZEE-SR, both white and yellow versions. They yielded 4.7 t/ha which represented 7% and 12% yield superiority over the parents TZEE-SR-W (4.4 t/ha) and CSP-SR (4.2 t/ha) respectively, CSP-SR x MAKA-SR which flowered in 51 days and yielded 5.2 t/ha will be retained for further testing. The incidence of the MSV was negligible even though few plants showed symptoms. Ear rot ratings on a scale of 1-5 ranged from 1.5 for CSP-SR x MAKA-SR to 3.0 for pop 101 from CIMMYT.

Mass Selection for Earliness and Color Separation

Selection for earlier fraction of variety crosses made in 1994 was carried out during the off-season of 1995 in Nkolbisson. The following variety crosses FBC_6 x MAKA-SR (53 days); FBC_6 x TZEE-SR-W (53 days); FBC_6 x TZEE-SR (Y) (53 days) and FBC_6 x CSP-SR (52 days) were planted in the breeding nursery in an attempt to bring the number of days from planting to silking to less than 50 days. The variety crosses were also evaluated for drought tolerance.

PROJECT I: Breeding for disease resistant intermediate maturing maize varieties (110 days to maturity)

The 1995 activities included:

1. Yield trial of variety crosses: Entries consisted of released varieties crossed to inbred lines.

2. SYNTHETIC Varieties trial (EVT-NCRE): Entries consisted of synthetic formed by recombining S_5 lines from TZB SR and Suwan 1 SR.

3. Cycle one formation of heterotic groups by recombination of selected lines from previous full-sib family evaluations.

4. Single cross evaluations.

This involved the following:

- Crosses between lines from different heterotic groups.
- Crosses involving mid-altitude and lowland inbred lines.

PROJECT 5: Effect of improved Fallow with *Cassia obtusfolia* on the performance of maize

The objective was to test the effect of *Cassia obtusifolia* on *Striga* infestation level and soil fertility improvement.

Cassia obtusifolia was planted and allowed to grow for one month before incorporation into

the soil at maize planting time. The treatments were the following:

- Check: Maize planted on a bare soil,
- maize planted in a plot where Cassia had been broadcast
- *Cassia obtusifolia* between and along the maize rows (40 cm row spacings)
- *Cassia obtusifolia* along the maize row (80 cm spacing)

Because of poor germination of the *Cassia* seed used and slow growth, its incorporation into the soil was delayed until a month after maize planting.

Results

The results presented in Table 5 showed that:

- *Striga* emergence was higher in plots without legume than when *Cassia* was used.
- The method of seeding of the *Cassia* did not have any effect on *Striga* emergence.
- No yield differences were detected in plots with *Cassia* compared with those plots in which the maize was directly seeded.
- It is anticipated that because of the slow growth and poor germination of *Cassia*, bio-physico-chemical changes in the soil induced by the legume might have been enough to reduce the *Striga* infestation level but not to result in a yield increase.
- Owing to the short duration of the growing season, rotation with a legume instead of a catch crop might be a better alternative.

Table 5 Effect of *Cassia obtusifolia* on maize (CMS 9015) yield and *Striga* emergence*

Treatments	SITES 1	2	3	Mean
1. Check (Direct seeding)	4668	10719	9221	8203
	669	2426	1296	1464
2. *Cassia* broadcast	2075	3112	6685	3957
	824	1856	1399	1360
3. *Cassia* inter-row spacing of 40 cm	1037	657	4478	1255
	824	1596	1451	1290
4. *Cassia* inter-row spacing of 80 cm	5187	9332	5994	6838
	555	2375	1659	1530

* Figures underlined represent the number of *Striga* plants/ha at ten weeks after planting maize while the figures not underlined represent the maize grain yield in Kg/ha.

PROJECT 8: Effect of *Parkia biglobosa* pods on *Striga* incidence in maize (TZEE-W-SR)

The objective of this study was to test the potential of *Parkia* pods to reduce *Striga* infestation levels.

The results presented in Table 6 indicated that despite a slight improvement of maize grain yield when *Parkia* pods were applied, no consistent reduction in *Striga* emergence was observed at both sites. There was even an increase in *Striga* counts at site 1.

Table 6. Effect of *Parkia biglobosa* pods on maize

SITES		Grain yield (kg/ha)	*Striga* emergence/ha
Site 1	No Parkia	714	4500
	Parkia	1155	6429
Site 2	No Parkia	1833	26053
	Parkia	2230	20231

PROJECT 7: Promotion of on-farm level seed production

The objectives of this project were to:

- produce and maintain breeder and foundation seed of released varieties.
- promote the diffusion and utilization of seed of improved varieties by farmers.

Farmers who had between 0.25ha and 0.50 ha of isolated fields were selected for the project. The breeding unit provided seed, inputs and advice on seed production and handling. At harvest, the breeding unit collected back 1/3 of the seed produced by each farmer.

On farm level seed production activities carried out in 1995 are shown in Table 7.

Table 7: On-farm level seed production activities of Cameroon in 1995

ZONE	VILLAGES	N° of Farmers	Variety	Maturity Cycle
Guinea Savanna	Djalingo	4	CMS 8704	110 days
		3	CMS 9015	90 days
	Babla	2	CMS 8501	110 days
		3	CMS 9015	90 days
	IRZV	3	TZEE-W-SR	85 days
Sudan Savanna	Mora	3	TZEE-W-SR	85 days
	Tchatibali	2	CMS 9015	90 days
		2	CMS 8806	90 days
	Yagoua	2	CMS 9015	90 days
	Kaelé	2	TZEE-W-SR	85 days
		26		

A total of 26 farmers participated in the project. Six of the farmers planted 110 day varieties, 8 farmers planted the extra-early variety TZEE-W-SR while 12 farmers planted the 95 day variety CMS 9015 (Pool 16 DT). The quantity of seed of each variety produced is presented in Table 8.

In addition to the seed produced by the farmers, the unit planted the following varieties in isolated half-sib blocks for maintenance: CMS 8501 (0.5 ha); CMS 8704 (0.5 ha); CMS 8806 (0.5 ha); CMS 9015 (0.5 ha); TZEE-W-SR (0.25 ha) and Pop corn (0.5 ha).

Table 8. Quantity of seed produced on-farm in 1995 in Cameroon

Varieties	N° of farmers	Land Area	Quantity produced	Quantity collected
CMS 8704	4	2 ha	5.6 tons	1.8 tons
CMS 8501	2	2 ha	6.4 tons	2.1 tons
CMS 9015 (Pool 16 DT)	10	5 ha	10.5 tons	3.5 tons
CMS 8806	2	2 ha	4.2 tons	1.4 tons
TZEE-W-SR	8	8 ha	8.5 tons	2.5 tons
Total	26	14 ha	35.2 tons	11.3 tons

Average yield produced for 110 day variety was 3.0 t/ha. The early varieties produced an average of 2.1 t/ha. The extra-early TZEE-W-SR gave 1.1 t/ha.

The unit was able to collect 11.3 tons of seed. Some of the seed will be given to on-farm researchers. The remaining seed will be sold to other farmers.

It is hoped that with the participation of more farmers, this activity will be able to sustain itself.

4.3 Progress report on collaborative research projects in Togo in 1995 by Mr A. Biliwa

Three projects were executed in Togo in 1994/1995.

PROJECT 4: *Striga* research

The activities carried out were:

1. Development of a technique for screening *Striga* tolerant varieties in the laboratory

2. Screening of African maize landraces for tolerance to *Striga hermonthica* under controlled, artificially infested conditions

Results:

- A survey in Kara and savanna regions has led to the identification of two local maize varieties TI_2BD and KPABRIDJAK which have been found to be tolerant to *Striga* under artificial infestations in pots.

- Use of *Parkia biglobosa* pods for *Striga* control.
  Solutions obtained from macerations of *Parkia biglobosa* pods in distilled water for 96 hours in laboratory have led to the following conclusions:

  - There exists germination inhibitors for *Striga* seeds in macerations obtained from *Parkia biglobosa* pods.

  - Concentrated macerations fully inhibit *Striga* seed germination.

PROJECT 6: Technology transfer in Kara and savanna regions

The objectives of this project were to:

1. Introduce improved, adapted varieties and agronomic practices to maize farmers

2. Strengthen researcher/extentionists/farmers linkages in an effort to promote the transfer

of technologies.

On-farm variety trials

The analysis of the results of the study revealed no significant differences in the grain yield of the varieties evaluated (Table 9).

The economic analyses showed that with a cost of production of 61625 F, a farmer could make a profit ranging from 1875 F in Bafilo East to 79625 F in Koukou zone if the improved varieties evaluated were adopted (Table 10).

Table 9. Grain yield of maize varieties evaluated on-farm in two regions of Kara

Sector	Southern Sector	Zone	Grain yield (Kg/Ha)			Mean grain yield of zones
			AMEN	AB11	Check	
ASSOLI	Bafilo Bafilo	Bafilo Est Bafilo Centre	1280 1910	1450 2310	1080 2120	1270 2113
Doufelgou	Défalé Siou	Bega Ouest Koukou	3330 3300	1590 2930	1160 2250	2027 2827
Regional mean grain yield			2455	2070	1652	2059

Field day

A field day was held on 25 October, 1995 at Koukou and was attended by several extension officials and over 100 farmers.

Amen was identified by the farmers as the most promising variety because of the large ear size and its good tip cover. In addition, a socio-economic analysis has shown high profit margins under improved agricultural practices with early varieties such as Amen and AB II as they afford the opportunity for intercropping with cowpea.

PROJECT 7: Community seed production

The objectives of this project are to:

1. Train farmers in techniques of seed production

2. Strengthen the capacity of seed producers to produce good quality seed and improve the

distribution of seed in rural areas.

Breeder seed production

- Breeders' seeds of 2 early varieties (Ikenne 8149 SR, AB-II) and 2 extra-early (Amen, TZESR-W x GUA 314 BC2) were produced.

Table 10. Economic analysis of the grain yield of the three varieties evaluated at four locations in Togo in 1995

ZONE	Cost of production FCFA	Grain yield				Value of produce FCFA	Profit on 0.5 ha
		Amen	AB11	Local	Total		
Bafilo East	61625	213	242	180	635	63500	1875
Bafilo Center	61625	318	385	353	1057	105700	44075
Baga West	61625	555	265	193	1013	101300	39675
Koukou	61625	550	488	375	1413	141300	79625

Table 11. Amount of breeder seed produced in 1995

Station	Variety	Area (ha)	Production (kg)	Maturity Cycle
Adeta	Ikenne 8149 SR	0.25	300	early
"	AB II	0.5	450	early
Davie	Amen	0.5	240	Extra-early
"	TZESR-W x Gua 314	0.5	250	Extra-early

The breeder seed produced in 1995 would be used for community seed production in 1996.

4.4 Progress report on collaborative research projects in Mali in 1995 by Mr N. Coulibaly

Introduction

Maize is cultivated in Mali mainly for human consumption although its importance as a livestock (poultry) feed is growing in urban areas.

PROJECT 6: On-farm maize variety tests

The objective of this project is to provide farmers with improved, adapted maize varieties.

Three improved varieties (intermediate, early and extra-early) were compared with local varieties in farmers field at 3 locations in forty farms.

The varieties Sotubaka, EV 8422 SR, Niéléni and Appolo confirmed their good adaptation and superior performance over local checks at all the 3 test locations. These varieties are at the pre-extension stage in some areas and at the extension stage in others.

Sotubaka was the highest yielding yellow variety and had the advantage of being resistant to streak as well as to other foliar diseases.

Evaluation of the available varieties for baking bread by the Ministry of Agriculture in collaboration with national scientists and bakers have concluded that an acceptable bread could be prepared from a composite flour comprising 15% of maize and 85 % of wheat flour. It is expected that 50,000 tons of maize would be needed to supplement the wheat flour for bread baking.

PROJECT 7: On-farm seed multiplication

The objectives of this project are to:

1. Train farmers in seed production techniques

2. Produce enough seed for maize trials and community seed production.

Results:

- A total of 1.5 tons of seed was produced.

- About 20 farmers from each of the five villages selected were trained in community seed production.

PROJECT 4: Striga control

The objective of this project was to screen maize varieties for tolerance to *Striga hermonthica*

Results:

Among the 15 varieties tested at Sotuba and Sougoula, Tuxpeno 1, EV 8422 SR and E 211 produced the lowest yields. Appolo was the highest yielding variety (903 kg/ha) while

Tiémantié had the highest *Striga* infestation (275 *Striga*/plant). The least *Striga* infested varieties were Tuxpeno 1, EV 8422 SR, TZEE-W, Kogoni B and Mokwa with less than 100 *Striga* plants/plot.

PROJECT 8: Parkia biglobosa

The objective was to evaluate the effectiveness of *Parkia biglobosa* pods in *Striga hermonthica* control.

Results: *Parkia biglobosa* pods did not have any effect either on the maize yield or on *Striga* population

4.5 Progress Reports on Collaborative Research projects in Benin in 1995 by Mr J. Mouhouanou

Five projects were funded in 1995. These included:

- *Striga* control
- Technology transfer
- Agronomic research
- Seed production

PROJECT 4: Screening of trap crops in vitro for *Striga* control

Results:

In vitro stimulation of *Striga* seed germination was better with peanut varieties RMP 12, RMP 91, and 69-101. Cowpea variety 90 K-56 has shown effectiveness as a trap crop under artificial infestation.

PROJECT 5A Maize-groundnut association study

The highest grain yields were obtained when a maize row was associated with 2 rows of groundnut.

PROJECT 5B N application on early and Extra-early maize

Extra-early varieties: N application at planting time and 15-22 days after planting gave the highest grain yield.

Early varieties: N should be applied at planting and 28-30 days after planting.

Optimum N level and date of planting for extra-early varieties are yet to be established.

PROJECT 6: Technology transfer

On-farm tests involving TZEE-SR-W and Kamboinse 88 Pool 16 DT were conducted. Both varieties yielded more than the local varieties and were appreciated for the high yield and good taste.

PROJECT 7: Seed production at the on-farm level

This activity was carried out to promote the use of seed of improved varieties and training of farmers in seed production. Seed of the variety DMR-ESR-W was produced but data are not available.

4.6 Progress Reports on Collaborative Research projects in Burkina Faso in 1995 by Dr H. Idrissa

Six projects were funded by WECAMAN in Burkina Faso in 1995. These included the following:

PROJECT 2: Screening for early-drought and disease tolerant varieties.

The objectives of the project were to:

- Screen the available materials for earliness and tolerance to drought
- Evaluate the materials for combining ability
- Produce two improved populations (white and yellow)

Results:

- Diallels were created and tested in simple and tied ridges
- 10 best F_1 crosses in each color group have been selected for compositing to form the populations.

PROJECT 7: On-farm level seed production

The project has the following objectives:

- Variety maintenance
- Production of certified seed for farmers
- Training of extensionists/farmers in improved seed production techniques

Results:

- Varietal maintenance of 25 varieties was carried out. About 3 Kg seed of each variety was produced.

- About 1.5 tons of seed of improved varieties was produced by the farmers in 1995.

- About 105 farmers were trained in seed production techniques in five villages.

PROJECT 3: Screening for drought and disease tolerant extra-early varieties

The objectives of this project were to:

- Improve the population "Local Manga" for extra-earliness and drought tolerance.

- Test full-sib of F_5 families from Local Manga

- Recombine the top 10 FS families.

Results:

- The ten best families have been selected based on progeny yield trials involving 169 full-sib families from Local Manga.
  The ten top families yield an average of 4.9 t/ha under tied ridges and 4.4 t/ha under simple ridges.

- The ten top families would be recombined to form an experimental variety.

PROJECT 5B: Agronomic Research on extra-early, early and intermediate varieties

The objectives of this project are to study:

- Varietal response to locally available fertilization materials

- How to complement or substitute mineral fertilizer with/by Burkina phosphate and organic matter

- Compost production

Results:

The best formulation was found to be 300 kg/ha of Burkina phosphate + 5 t/ha of organic matter + 50 kg/ha of urea. This is equivalent to 100 kg/ha of NPK and 50 kg/ha of urea.

PROJECT 8: Parkia biglobosa

This project had the following objectives:

- The use of *Parkia biglobosa* pods to reduce *Striga* population in maize.
- To test the effect of *Parkia* pods on soil properties

Results:

The results so far obtained indicate the following:

- Biochemical analysis of *Parkia biglobosa* pods revealed the presence of fatty acids, tanins and reduced compounds of steroidal glycosides.
- *Parkia* pods can reduce *Striga* seed germination by 21 % compared to the check.
- Weed infestation reduction was observed (19 % reduction compared to the check).
- Soil humidity under treated plots was 78 % higher than in non- treated plots at panicle initiation/flowering stage.
- Reduction of cellulotic micro organisms was 78 % compared to check plots.
- reduction of maize plants/m^2 and ears/m^2 in *Parkia* pod-treated plots.

The optimum dose and the time for incorporation of *Parkia* should be determined for increased efficiency in the control of *Striga hermonthica.*

4.7 Progress Reports on Collaborative Research projects in Côte d'Ivoire in 1995 presented by Mr Angueté Kouamé

Four collaborative research projects were conducted during the 1995 growing season in Côte d'Ivoire.

PROJECT 1: Screening of intermediate maturing maize varieties (105-110 days) for resistance to the maize streak virus (MSV)

Two main activities were carried out during the off-season and in the major season of 1995.

a) Off-season activities
The off-season activities were:

- Screening of the F_1 generation of Eburma x TZSR Y at Ferkéssédouggou:

The most tolerant 300 to 500 plants have been selected.

- Formation of a population from crosses between composite Y x TZSR Y at Bouaké, followed by selfing of the F_1 to produce 300-500 ears in F_2.
- Screening of Appelon 51 for resistance to MSV.

b) Major season activities were as follows:

- Recombination of the F2 progenies from Eburma x TZSR Y.
- Recombination of the F2 progenies selected from Comp Y x TZSR Y in the 1995 off-season.
- Recombination of the 52 lines of Appelon, selected during the off-season of 1995.

PROJECT 5A: Development of cultural practices for optimizing the grain yield of some selected maize varieties.

The experiment involved 8 densities as follows:

Spacing (cm)	Plants/hill	Plant population density/ha
80/50	2 plants	50000
75/50	2 plants	53333
80/40	2 plants	62500
75/40	2 plants	66666
80/25	1 plant - 2 plants	75000
75/25	1 plant - 2 plants	80000
80/30	2 plants	83333
75/30	2 plants	88888

These densities were used to evaluate the varieties EV 8731 SR, EV 8746 SR and EV 8727 SR.

The experiment was planted on 7/17/95 at Bouaké and Ferkessedougou.

The results of the trial conducted in Bouaké in 1995 revealed no significant differences between the varieties or the plant densities. Similar results were obtained in Ferkessedougou except that significant differences were detected between the varieties. It may be noted that significant differences were detected between the different spacings in 1994. The lack of significant differences in the spacings in 1995 could be due to the high percentage of root and stem lodging during the grain filling period. The lodging appeared to be greater under close spacings than under wide spacings. In all cases the plots with low

density (80/50 and 75/50) had advantages such as more vigour, ease of movement in the field to carry out cultural practices, harvesting as well as bigger and well-filled ears.

PROJECT 5b: Integration of legumes in maize for weed control and soil fertility maintenance

a) Crop rotation

The following treatments were evaluated on a hectare of land in 1995:

T1	uncropped
T2	cotton
T3	groundnut
T4	cowpea
T5	soybean
T6	mucuna

Three levels of nitrogen were superimposed on each treatment: no urea, 50 kg/ha and 100 kg/ha of urea resulting in 18 treatments.

The results showed that the plots which had cotton and legumes as the precedent crops gave higher grain yield than the plots which were not cultivated in 1995 (Table 12). However, no significant differences were detected between the different legumes. Similarly, none of the precedent crops had significant effect on weed control. This indicates that even with a cover crop such as mucuna which can provide good cover within a short time, there is a need for several cycles of rotation in order to have significant effect on weed control.

Table 12 Maize grain yield (Kg/ha) as influenced by different precedent crops and fertilizer rates.

Cultural practice	Dose of urea (kg/ha)			
	0	50	100	Mean grain yield
Check	11,75	18,80	21,79	17,44
Cotton	27,81	28,54	25,95	27,44
Groundnut	30,53	32,87	30,73	31,38
Cowpea	33,05	34,94	29,33	32,44
Soybean	24,65	30,04	25,12	26,60
Mucuna	29,80	27,89	28,63	27,77
Average	27,94	28,85	25,25	27,35
LSD				8,69
CV (%)	20,67			

b) Maize-legume intercropping

This experiment was designed to determine the appropriate time for planting legumes in a maize-legume intercrop. It was conducted at Bouaké and Ferkéssédougou.

The planting dates of the associated crops were:

- Maize and legume planted on the same day
- Maize planted 2 weeks before legume
- Maize sown 2 weeks after legume.

The legumes used in the study were: groundnut, cowpea and soybean. Compared to 1994 when planting interval was 4 weeks between the associated crops, a better plant development was observed this year when a 2-week interval was adopted.

The results of the two-year study indicate that the effect of the different legumes on maize were similar and that the maize performed equally well when intercropped with groundnut, cowpea or soybean.

The best date of planting depends on whether one is more interested in the maize or the legume production. If the objective is to produce more maize, then the maize and legume could be sown at the same time or the maize could be sown two weeks before the legumes. On the contrary, if the interest is in the legume, then it would be advisable to plant the

legume first. Planting of the legume about two weeks before the maize was found to be better than the planting of the maize four weeks after the legume (Table 13).

Table 13 **Maize grain yield (Kg/ha) as influenced by different planting dates and intercropping with legumes.**

Date of planting	Legume							
	Bouaké				Ferkesséssédougou			
	Ground-nut	Cowpea	Soybean	Average	Ground-nut	Cowpea	Soybean	Average
Maize and legumes sown at the same time	4606	4454	4635	4565	1923	3256	2038	2405
Maize sown 2 weeks before legume	4564	4402	4666	4544	3040	2168	2466	2558
Maize sown 2 weeks after legume	2567	2457	3226	275	1939	1184	1761	1628
Mean	3913	3771	4176	3953	2301	2202	2089	2197
LSD (5)				927				630
CV (%)	27,84 %				32,02 %			

PROJECT 4: **Technology transfer**

Six varieties including 3 extra-early (CSP-SR, TZEE-W-SR, TZE SR x GUA 314) and 3 early (Kamboinse 88 Pool 16 DT, TZE Comp 4, DMR-E-SR-Y) varieties, were tested at Nielle, Ferkessedougou, Korhogo, and Boundiali.

The trial was conducted on six farmers' fields at each site. Twenty-one out of the 24 trials initially planned were conducted. It was observed that the local checks varied from one farmer to another and were in all cases too late (120 days to maturity) for the early or extra-early maturity group.

There were no significant differences among the varieties in terms of grain yield. However, the farmers generally preferred CSP-SR BC_5 due to its desirable taste and color. The farmers' preference for the varieties at the different locations were as follows:

Korhogo	-	CSP-SR BC_5
Nielle	-	CSP SR BC_5 and DMR-Y-SR
Boundiali	-	TZE Comp 4 and DMR-Y-SR
Ferkéssédougou	-	TZE Comp 4 and DMR-Y-SR.

4.8 Discussion of Progress Reports on Collaborative Research Projects

Following the presentations of the progress reports on collaborative research projects, several points were discussed by the Steering Committee. The following important points were noted:

1. The need to demonstrate impact where possible in reporting progress was stressed. For example, in projects dealing with seed production, the quantity of breeder, foundation and commercial seed produced should be clearly stated. In addition, it would be important to indicate the cost of producing the seed.

2. The suppressive effects of sequential cropping of maize in *Striga* screening nurseries on maize plant growth and productivity observed in Ghana had also been observed at IITA. Attempts should be made to rejuvenate fertility of the fields through the use of appropriate cover crops such as *Mucuna*.

3. On the status of research on the larger grain borer in the sub-region, Mr Biliwa, the Steering Committee member from Togo and also an active researcher on the larger grain borer indicated that biological, chemical and cultural control methods for the pest were being investigated. This project was not submitted to WECAMAN because it was already being funded through IITA.

4. The Regional Adaptive Trial on the use of *Parkia biglobosa* pods to control *Striga* in maize would be continued by only Burkina Faso which has the expertise and the facilities to conduct an in-depth research into the different aspects including the chemical properties of *Parkia*.

5. Mr N'Tji Coulibaly, a member of the WECAMAN Steering Committee and the national maize coordinator of Mali was honored by the Malian President who decorated him with the National Medal of Honour. This was in recognition of maize production increases in Mali as a result of effective technology transfer system.

6. The efforts of the national maize program of Mali had also resulted in increased industrial utilization of maize. As a result of the high consumer acceptance (87%) of the French bread baked with 15 % corn flour (20 FCFA lower in price per baguette compared to 100 % wheat flour) the Finance Ministry plans to gradually withdraw subsidies on a part of the imported wheat flour.

7. The cotton extension agency, MDT and the government of Mali have increased their contribution to the maize research program and it is anticipated that maize production in Western Mali would be intensified by increased technology transfer efforts.

8. It was evident that technology transfer efforts in WECAMAN member countries had intensified, particularly in Mali, Ghana, Burkina Faso and Côte d'Ivoire. Also member

countries were making good progress in seed production using the existing government structures, NGOs and farmer organizations.

9. There was an increased rate of recovery of data from the Regional Uniform Variety Trials (83-89%).

5.0 HIGHLIGHTS OF MAIZE RESEARCH ACTIVITIES BY INTERNATIONAL CENTERS

5.1 Maize Improvement Program of IITA

Highlights of research activities of the IITA Maize Improvement Program were presented by Dr J. Kling. The main ideas synthesized from Dr Kling's presentation were:

1. *Striga* control was the number one priority research area at IITA. Maize populations of different maturity groups with resistance / tolerance to *Striga* were being developed.

2. The development of varieties efficient in nitrogen use was being pursued. Results indicated that TZB-SR was poor in N use efficiency while the inbred line KU 1414 was the best N efficient genotype. The hybrid 8321-18 is the best variety in terms of N use efficiency.

3. Seedling root vigor does not seem to influence N use efficiency since correlation between the two traits was low. The poor correlation was probably due to the low demand for N at the seedling stage of plant development.

5.2 IITA Post Harvest Unit Research Program

Dr K. Cardwell briefed participants on a seminar organized on mycotoxins at Cotonou in November 1995. The message from Dr Cardwell's presentation was as follows:

(i) Aflatoxin is carcinogenic and suppresses the immune system in laboratory animals.

(ii) Ninety-eight percent of people in West Africa have aflatoxins in their blood while 70 % of babies in the sub-region test positive to abnormal aflatoxin levels.

(iii) Acceptable aflatoxin level in food is about 7 parts in billion, but cereal-based foods in West and Central Africa have levels which far exceed this.

(iv) Aflatoxin levels of maize grain in West Africa are low at harvest but increase tremendously thereafter. Factors which promote build up of aflatoxin in maize are drought during the growing period, late harvesting and poor storage practices.

(v) There is a need for concerted effort to tackle the aflatoxin problem in the sub-region.

WECAMAN is willing to participate in any project in this direction but funds are needed for such a program.

5.3 CIMMYT-CI Maize Research Program

The highlights of the 1995 maize research activities of CIMMYT-Cote d'Ivoire were presented by Dr A. O. Diallo. The following points were noted:

(i) 100 S4 lines were evaluated under drought, low nitrogen and high density across 5 locations in Côte d'Ivoire. Three lines performed well across stresses (drought, low nitrogen, high density). The yield stability was associated with stable root quality.

(ii) Thirteen drought resistant inbred lines developed by the CIMMYT physiology program had been found streak resistant. Seed is available.

(iii) Seven lines have shown resistance to *Striga* for 3 years (in terms of emerged *Striga* plants). CML25 developed by the CIMMYT hybrid program had been identified as *Striga* resistant. These findings were in agreement with the findings of Fasil Breda (Purdue University) and J. Ransom in Kihos (CIMMYT-Kenya).

(iv) Pop 44 SR (Across 9144 SR) appeared to be the most *Striga* resistant, late White CIMMYT population. The frequency of *Striga* resistant lines from this population was higher than any others.

(v) Two extra-early populations (white and yellow) were being converted for streak resistance and seed will be available next year.

(vi) Thirteen early DMR populations from CIMMYT Asian Maize Program were being converted for streak resistance. F_2 seed of BC_6 were available.

(vii) Grain yield of 12 t/ha was recorded at Odiené (Côte d'Ivoire).

(viii) Two acid soil tolerant populations were being converted for streak resistance. F_1 seed of the BC_1 are available.

6.0 REVIEW OF THE WORKPLAN AND BUDGET OF WECAMAN FOR THE PERIOD OCTOBER 1, 1995 - SEPTEMBER 30, 1996

6.1 Regional trials

New entries were nominated for the Regional Uniform Variety Trials of 1996. The varieties ACR 92 TZE Comp 5 (white), AK 9331 DMR-SR (Yellow) were nominated by IITA and EV DT 94 and DT-E-Y-SR by WECAMAN for the 1996 RUVT-early. ACR 92 TZE Comp 5 is tolerant to *Striga* while AK 9331 DMR-SR is resistant to downy mildew. Both IITA

varieties have high yield potential and are resistant to maize streak virus. EV DT 94 and DT-E-Y SR both possess tolerance to drought stress and were developed from Pool 16 DT x Pool 16 Sequia and DR-Y-Pool, respectively.

Two entries, namely 95 TZEE-W_1 and TZEE-W_2 derived from crosses between extra-early germplasm and the inbred 1368 were nominated by WECAMAN for the 1996 RUVT-Extra-Early. The sets of the trials requested by WECAMAN member countries are presented in Table 14.

Table 14. Sets of Regional Uniform Variety Trials Requested by WECAMAN member countries in 1996

Country / Program	Number of trials requested	
	RUVT-Early	RUVT-Extra-Early
Burkina Faso	3	3
Mali	2	3
IITA - Ibadan	2	2
Cameroon	3	3
Ghana	3	3
Togo	3	3
Côte d'Ivoire	2	2
Benin	4	2
IITA - CI	1	1

6.2 Monitoring tour

The monitoring tour planned for Ghana and Burkina Faso will take place between late August and early September. The Steering Committee members from Ghana and Burkina Faso were asked to make a short presentation on what had been planned in each country.

Dr Sallah indicated that the tour to Ghana would cover maize research, extension, production, and utilization systems in northern Ghana since harvesting would be over in the South by the time the tour takes place. Participants, however, were of the view that it would be important to visit the Crops Research Institute in Kumasi as well because the bulk of maize research was conducted in Kumasi. Dr Hema Idrissa indicated that in

Burkina Faso, Kamboinse, Saria and Farakoba stations would be visited. However, details of the institutions and programs along with dates would be communicated to the Coordinator after planting. The Steering Committee suggested to both countries to ensure that NGO activities were included in the program. The Steering Committee also recommended that a post-harvest specialist from Togo should be included in the tour and the Coordinator was tasked to inform the Director of Research of Togo of this change.

The change was necessary to make the composition of the tour participants as much as possible inter-disciplinary. Furthermore, the participant proposed by Togo had participated in the previous monitoring tour. The Steering Committee appealed to the Director of Research of Togo to use his good offices to effect the change. Countries which were yet to submit nominations for the tour were requested to do so without delay.

6.3 Technician training course

The technician training course will be held at Ferkéssedougou as planned. Countries which were yet to nominate candidates for the course were requested to do so without further delay. To a suggestion that the number of participants of the course should be increased to improve its cost-effectiveness, it was pointed out that this could not be done because of limited facilities and funds.

6.4 Advanced Computer course for agronomists and breeders

This course would take place at IITA - Ibadan, Nigeria from June 10-22, 1996. Apart from Nigeria where there are no maize breeders working in the savanna zone, all other countries were requested to ensure that one breeder and one agronomist were nominated for the course by each country. Nominations which did not follow this guideline would be rejected.

6.5 National maize workshops and planning sessions in 1995

In order to document the effort made in strengthening researcher-extensionist-farmer linkages in member countries, each country was asked to give an up-date on national workshops and planning sessions organized in each country in 1995. The main points noted were as follows:

1. Benin	WECAMAN has allocated $2000 to Benin to help organize a national maize workshop. An appeal was made in Benin for more funds which was recently obtained. The workshop is planned for 1996.
2. Cote d'Ivoire	Not much has been achieved so far because of lack of funds.
3. Togo	A proposal for assistance to organize the workshop had been submitted but the network was yet to receive the proposal.

4. Cameroon — Planning sessions are routine exercises for research planning each year. National maize workshop had not been held yet.

5. Mali — As in Cameroon, planning sessions were held every year. However, a maize workshop had not yet been organized in the country.

6. Ghana — Planning workshops were held in all agro-ecological zones in 1995 and 1996. These were organized before the planting season each year. A national workshop, covering all crops was held in Kumasi in 1995. Another workshop was held at Nyankpala from 23-26 April, 1996.

7. Burkina Faso — Open days were organized but planning sessions were not held in 1995.

6.6 Development of extension materials for WECAMAN member countries

Togo was the only country which had submitted extension manuals to the network for publication. The status of manual preparation in the other countries was as follows:

Benin — Draft manuals had been sent to several national institutions for editing.

Burkina Faso — The manuals were being prepared and would soon be submitted to the Coordinator

Côte d'Ivoire — Two scientists participated in the course in Ghana which was commended highly. Only one of these scientists is currently at post; the other is on study leave. The Steering Committee member from Côte d'Ivoire would find out what progress had been made and would make a report to the Coordinator.

Mali — The documents had been sent to the Coordinator but not yet received.

Cameroon — Documents were ready and would soon be sent to the Coordinator.

Ghana — Many extension materials had already been produced in Ghana and these were being used all over the country. One of these manuals was being up-dated to justify reprinting by the network and would soon be sent to the coordinator.

6.7 Impact assessment study on maize in Cameroon, Benin and Togo

Proposals on the impact study submitted by Cameroon and Togo to the network had been referred to an IITA economist for review. Benin was allocated funds two years ago to conduct an impact study. The study was conducted some time last year but Benin was yet to submit a report to the network. This report was long overdue and Benin was requested

to submit the report to the Coordinator as soon as possible.

The Steering Committee also endorsed the suggestion that an impact assessment study on the community seed production project of WECAMAN should be conducted by Burkina Faso, Benin, Cameroon and Mali.

7.0 REVIEW OF THE LOGFRAME OF WECAMAN

Seven commodity research networks funded by USAID in West Africa were reviewed in order to assess program progress of projects terminating in 1995 and to monitor their progress towards impact.

The report recommended that the logframe and indicators of each network, including WECAMAN should be reviewed and revised to insure that initial strategies were identified and activities planned to achieve impacts for technologies being developed or those already on the shelf.

The Steering Committee endorsed this recommendation but stressed that expertise was needed to review and revise the logframe of WECAMAN to insure its relevance to the network. A committee comprising the following was set up to review and revise the logframe:

Dr F. M. Quin
Dr J. M. Fajemisin
Dr K. Prudencio
Dr B. Badu-Apraku (Coordinator)

8.0 ELABORATION OF STRATEGIES TO EXPAND AND SUPPORT RESEARCH-EXTENSION LINKAGES IN WECAMAN MEMBER COUNTRIES

The USAID sponsored program impact assessment of WECAMAN concluded that strategies to expand and support research-extension linkages were not fully elaborated suggesting lack of focus. To overcome this difficulty, the Steering Committee appointed a sub-committee to identify constraints and develop strategies to promote technology transfer and adoption in the sub-region.

The membership of the sub-committee was as follows:

1. Directors of Extension (One from Ghana and another from Mali)
2. Active maize researcher - Dr Titus Ngoumou Nga (Agronomist)
3. Coordinator - Dr B. Badu-Apraku
4. Either Prof Ogunbile or Dr Adesina

9.0 ANY OTHER BUSINESS

9.1 Regional Research Project on Maize and Cassava (RRPMC)

RRPMC during its meeting from March 4-6, 1996 decided to organize a workshop in December 1996 and appeal to WECAMAN to sponsor participants from the network to this workshop. Because of lack of funds, the Steering Committee suggested that a request be sent to RRPMC to request it to consider sponsoring participants from WECAMAN. The Coordinator was asked to communicate this decision to RRPMC.

9.2 Regional project on aflatoxins in maize

Dr K. Cardwell informed the Steering Committee that DANIDA was willing to fund a project on aflatoxins in maize and proposed that WECAMAN consider implementing such a project. The Steering Committee endorsed the proposal and requested Dr Cardwell to prepare a draft proposal for the project. Copies of the proposal should be sent to the chairman, Secretary of the Steering Committee and to Mr N'Tji Coulibaly for their comments and approval.

A copy of the proposal should also be sent to the WECAMAN Coordinator, Dr F. M. Quin and Dr M. W. Bassey. The final proposal should be signed by the Chairman of the Steering Committee and submitted to DANIDA through IITA.

9.3 Consultation visits to National Programs

The Coordinator and when necessary members of the Steering Committee undertake consultation visits to national programs. The objectives of the visit are to monitor collaborative research projects in the countries visited, identify constraints that limit implementation of the projects and suggest ways to overcome such constraints.

The following visits were endorsed by the Steering Committee for 1996:

Togo - To be visited by Coordinator and Chairman of Steering Committee

Benin - Coordinator and Mr A. Biliwa

Nigeria - Dr Titus Ngoumou Nga

Côte d'Ivoire - Dr H. Idrissa to interact with the maize breeders in IITA-Côte d'Ivoire

9.4 Industrial / alternative uses of maize

Each country was asked to compile information on the local uses of maize. This information should be shared among network member countries to promote the utilization

of maize in the sub-region. In addition, industrial utilization of maize e.g. brewing lager beer, composite flour, feed formation, etc. should be explored in each country.

10.0 RECOMMENDATIONS

The following recommendations were made by the participants at the end of the two-day meeting of the Steering Committee:

1. Mycotoxins such as aflatoxins in maize have a direct negative impact on human and animal health and on the market value of the commodity. It is recommended that NARS which are committed to the promotion of food security and safety must take appropriate measures to reduce the deterioration in maize grain quality caused by mycotoxins.

2. The Steering Committee has noted with great concern the general lack of information flow about network activities among NARS scientists in some countries and strongly recommend to those national programs which have not ensured a broad-based participation in WECAMAN activities to endeavor to include all scientists in future network activities.

3. The Steering Committee appeals to IITA to consider as a matter of urgency the commitment of resources to insure the training of a maize researcher in Mali to a PhD level and a researcher in Burkina Faso to PhD level in crop protection.

11.0 CLOSING REMARKS BY Dr S. K. REDDY

Mr Chairman, Representative of IITA, Dr Cardwell and members of the WECAMAN Steering Committee:

1. On behalf of USAID, I have great pleasure in congratulating the Maize Research Network members for another year of good work.

2. We are pleased to note substantial improvement in the quality of reporting, that was attested by Dr F.M. Quin/IITA, who chaired the Ad hoc Research Committee of the network which reviewed 1995 Annual Reports and 1996 proposals. I complement all those who contributed good reports and proposals and encourage others to follow suite.

3. USAID has been stressing the need for increased efforts to transfer technologies and demonstrate impacts. I am pleased to note increased efforts at seed production in Mali, Burkina Faso, Benin and Ghana and the promotion of industrial use of maize in Mali. We are also pleased to note the linkages you are developing with NGO's and farmers associations to promote seed production. Please continue and redouble your efforts in this regard. Though limited in number, technology transfer grants (recently approved) should give your efforts added help. In this regard, I have made suggestion to your

coordinator, Dr Apraku, to examine the possibility of holding a special meeting on seed production.

4. It is my impression that the three networks which USAID has been financing have matured professionally and are able to manage their affairs to our satisfaction. They are setting their research agendas and have assumed ownership of networks in many respects. We complement you on this significant achievement and also acknowledge the assistance of the three IARCs-IITA, WARDA and ICRISAT in this regard. However, the question of sustainable funding for these networks needs increased attention from the network to find a solution.

5. I congratulate you all on behalf of USAID for the good effort and would like to recognize Dr Apraku for the excellent coordination and direction to the effort. Thank you very much for allowing me to share these thoughts with you all.

Appendix 1 List of participants of the fifth meeting of the Steering Committee of WECAMAN

Members of Steering Committee

1. Dr P.Y.K. Sallah, Crops Research Institute, P.O. Box 3785, Kumasi, Ghana Tel: (233) 51 60389

2. Dr Baffour Badu-Apraku, IITA-Savana Station, c/o ADRAO, BP 2551, Bouaké, Republique de Côte d'Ivoire

3. Mr N'Tji Coulibaly, IER BP 258, Bamako, Republique du Mali Tel: (223) 22-60-08/ Fax: (223) 22-37-75

4. Dr Titus Ngoumou Nga, Institute of Agronomic Research, Box 415, Garoua, Republic of Cameroon Tel: (237) 27-30-87 / Fax: (237) 27-22-55

5. Dr Monhouanou D, Jean, LTA BP 128, Porto-Novo, Republique du Benin Tel: (229) 21-41-60 /Fax: (229) 30-37-70

6. Dr Hema Idrissa, Sélectionneur maïs, INERA, 01 BP 476, Ouagadougou 01 Burkina Faso Tel: (226) 31-92-08 / Fax: (226) 31-92-06

7. Mr Biliwa Alona, Direction de la Protection des Végétaux, BP 1263 Lomé, Togo Tél: 25-37-73 / Fax: 21-10-08 / Tlx: 5163 GTZ SST TO

8. Mr Angueté Kouamé, 01 BP 633, Bouaké 01, Republique de Côte d'Ivoire Tel: (225) 63-51-22 / 63-31-26

Observers

1. Dr Ouedraogo Mahama, OAU/CSTR-SAFGRAD, 01 BP 1783, Ouagadougou 01 Tel: (226) 30-60-71/61-15/98 / Fax: (226) 31-15-86 / Tlx: 5381 BF

2. Dr Sam Ajala, IITA, Oyo Road, PMB 5320, Ibadan, Federal Republic of Nigeria

3. Dr Abebe Menkir, IITA Oyo Road, PMB 5320, Ibadan, Federal Republic of Nigeria

4. Dr Kitty Cardwell, IITA Ibadan/Cotonou

5. Dr Alpha Oumar Diallo, IITA Bouaké, 01 BP 2551, Bouaké, Côte d'Ivoire Tel: (225) 63-45-14 / Fax: (225) 63-47-14 / Tlx: 69138 ADRAO CI

6. Dr Fajemisin, Joseph M., IITA Bouaké, 01 BP 2551, Bouaké, Côte d'Ivoire Tel: (225) 63-45-14 / Fax: (225) 63-47-14/Tlx: 69138 ADRAO CI

7. Dr S. K. Reddy, USAID/REDSO-WCA, 01 BP 1712, Abidjan, Côte d'Ivoire Tel: (225) 41-35-29

8. Dr F. M. Quin, IITA, Oyo Road, PMB 5320, Ibadan, Federal Republic of Nigeria

Appendix 2 Agenda for the fifth meeting of the Steering Committee of WECAMAN, IITA-Cotonou, Benin 24-25 April, 1996

Wednesday April, 24

OPENING SESSION

Chairperson:	Chairman of the WECAMAN Steering Committee, Mr Jean Monhouanou
08 : 00 - 08 : 30	Registration of participants
08 : 30 - 08 : 40	Welcome address by the chairperson
08 : 40 - 08 : 50	Remarks by the Director of the Crop Improvement Division of IITA - Dr F. M. Quin
08 : 50 - 09 : 00	Remarks by the International Coordinator of OAU/STRC - Dr Taye-Bezuneh
09 : 00 - 09 : 10	Remarks by the Director of the International Cooperation Division of IITA - Dr M. W. Bassey
09 : 10 - 09 : 25	Remarks by the representative of USAID - Dr S. K. Reddy
09 : 25 - 09 : 40	Welcome address by the Director of Agronomic Research of Benin - Dr M. Houssou
09 : 40 - 10 : 10	Group photograph and coffee break

SESSION I

Chairperson:	Chairman of the WECAMAN Steering Committee, Mr Jean Monhouanou
10 : 10 - 10 : 20	Adoption of the agenda
10 : 20 - 10 : 50	Network Coordinator's report by B. Badu-Apraku
10 : 50 - 11 : 20	Report of the WECAMAN Research Committee by Dr F. M. Quin
11 : 20 - 12 : 00	Discussions

SESSION II Presentation of Progress Reports on 1994/95 Collaborative Research Projects of WECAMAN

Chairperson: Dr F. M. Quin

12 : 00 - 12 : 30	Cameroon	-	Dr Titus Ngoumou Nga
12 : 30 - 13 : 00	Nigeria	-	Prof A. O. Ogunbile
13 : 00 - 14 : 00	Lunch break		
14 : 00 - 14 : 30	Benin	-	Mr Jean Monhouanou
14 : 30 - 15 : 00	Cote d'Ivoire	-	Mr Angueté Kouamé
15 : 00 - 15 : 30	Burkina Faso	-	Dr Hema Idrissa
15 : 30 - 15 : 45	Coffee break		
15 : 45 - 16 : 15	Ghana	-	Dr P. Y. K. Sallah
16 : 15 - 16 : 45	Togo	-	Mr Alona Biliwa
16 : 45 - 17 : 15	Mali	-	Mr N'Tji Coulibaly
17 : 15 - 18 : 00	IITA and CIMMYT	-	Dr Diallo, Dr Kling, Dr Cardwell

Thursday, April 25

SESSION III

Chairperson: Chairman of WECAMAN Steering Committee

08 : 00 - 10 : 00 Review of the workplan and budget of WECAMAN for the period October 1, 1995 - September 30, 1996

(i) Regional trials

(ii) Monitoring tour

(iii) Technician training course

(iv) Advanced computer course for agronomists and breeders

(v) National maize workshops and planning sessions

(vi) Development of extension materials for WECAMAN member countries

(vii) Impact assessment study on maize in Cameroon, Benin and Togo

10 : 00 - 10 : 20 Coffee break

10 : 20 - 11 : 00 Discussion of Assessment of Program Impact (API) Report and review of the logframe of WECAMAN Proposal

11 : 00 - 11 : 30 Elaboration of strategies to expand and support research-extension-farmer linkages in WECAMAN member countries

11 : 30 - 12 : 30
- Any other business
- Report on RRPMC Steering Committee meeting
- Consultation visit to National Programs
- Industrial/alternative uses of maize.

12 : 30 - 13 : 00 Recommendations of the fifth meeting of the Steering Committee

13 : 00 - 14 : 00 Lunch break

14 : 00 - 16 : 00 Preparation of the draft report of the proceedings of the fifth meeting of the WECAMAN Steering Committee

CLOSING SESSION

Chairperson: Chairman of WECAMAN Steering Committee

16 : 00 - 16 : 30 Report and recommendations of the Steering Committee meeting

16 : 30 - 17 : 30 Closing remarks

- IITA
- USAID
- Chairman of WECAMAN Steering Committee

1996-04

WECAMAN, Proceedings of the fifth meeting of the Steering Committee

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