

USAID/SAFGRAD/OAU-STRC/ICRISAT

WEST AND CENTRAL AFRICAN
SORGHUM RESEARCH NETWORK
(WCASRN)

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ANNUAL PROGRESS REPORT

June 1991 - May 1992

International Crops Research Institute
for the Semi-Arid Topics
(ICRISAT)

West African Sorghum Improvement Program

B.P. 320, Bamako, Mali

June 1992

TABLE OF CONTENTS

Introduction	Page 1
Program Description and Objectives	Page 1
Scope of the Report	Page 1
Research Projects	Page 1
Background	Page 1
Special Meeting on Anthracnose Project	Page 1
Working Group Meeting on Research Projects	Page 2
Special Meeting on <i>Striga</i>	Page 2
Visit to National Programs	Page 3
The Tenth Strering Committee Meeting	Page 3
Mini-Monitoring Tour	Page 4
In-Service Training-Plant Protection	Page 4
Financial Support to Nars	Page 4
Lead NARS - Research Projects	Page 4
Non-Lead NARS	Page 4
Financial Reports and Justification of Expenditure	Page 5
Network Impact Studies - Preliminary Activities	Page 5
Brochure on Head Bugs.	Page 5
Regional Trials and Nurseries.	Page 6
1991 Results	Page 6
1992 Trials	Page 7
Difficulties and Shortcomings	Page 7
Financial Accountability	Page 7
Regional Trials	Page 7
Reports and other Documents in French	Page 7
Visits to Nars	Page 7
Future Plans	Page 8

ANNEXES

ANNEX 1

Research Project Evaluation Form

ANNEX 2

Minutes of the 10th Steering Committee Meeting

ANNEX 3

1. Questionnaire on use of varieties
2. Participation of NARS in Network Activities 1986 - 1991

ANNEX 4

1991 Regional Trials

1. Trial Results: Tables 1 to 9
2. Number of Trials and Results
3. Regional Trials and Originating Programs

INTRODUCTION

Program Description and Objectives

Scope of the Report

This report is a summary of the major activities conducted by the West and Central African Sorghum Research Network (WCASRN) between June 1991 and May 1992. The following areas are covered in the report:

- research projects,
- special meeting on *Striga*,
- visits to national programs,
- the tenth steering committee meeting,
- monitoring tour,
- in-service training on plant protection,
- financial support to NARS,
- Network impact studies,
- brochure on head bugs, and
- regional trials and nurseries.

Difficulties and shortcomings are discussed and plans for the future are described. Unlike previous reports, tables of results of the 1991 regional trials are in the annex. Details have been kept to the minimum, especially for activities in which separate reports are being prepared, as for example, the working group meeting on the research projects.

RESEARCH PROJECTS

Background

WCASRN had identified five NARS as Lead Centers for funding of research projects: Burkina Faso for leaf anthracnose, Cameroon for *Striga*, Mali for head bugs, Niger for long smut and grain quality, and Nigeria for utilization (wheat/sorghum composite flour). It is important that these research projects are properly monitored and evaluated to ensure high standards and to guarantee a regional outlook. A working group is a forum for NARS scientists to evaluate the projects, to discuss common problems and to make recommendations for the future.

Special Meeting on the Anthracnose Project

One of the research projects funded by WCASRN is on sorghum anthracnose and research is conducted by the national program of Burkina Faso. During previous years, the national program of Mali has shown interest in this disease, which is considered by many as the most important

sorghum foliar disease. The ICRISAT pathology subprogram in Bamako, Mali, has a research project on various aspects of the foliar stage of the disease. Mr. Adama Neya, the principal investigator of the project in Burkina Faso, and Mr. M. Diourté, cereals pathologist in the national program of Mali, were invited by WCASRN to a meeting in Bamako. The meeting took place on 3 - 4 June 1991 at ICRISAT's West African Sorghum Improvement Program (WASIP-Mali) facilities about 16km from Bamako. Also present at the meeting was the WASIP-Mali pathology subprogram staff. The objectives of the meeting were:

1. To inform the national programs of Burkina Faso and Mali on recent results obtained by WASIP-Mali on laboratory work on the variability of the leaf anthracnose fungus *Colletotrichum graminicola*.
2. To decide on collaborative areas of research on anthracnose for the two national programs and WASIP-Mali.
3. To decide on common approaches with respect to the identification of pathotypes of *C. graminicola* in West African.

Discussions were held on 3 June and laboratory visits took place on 4 June. Preliminary results on the variability of *C. graminicola* from the project in Burkina Faso and WASIP-Mali were presented. Agreement was reached on the following aspects:

- entries in a variability trial.
- emphasis on the grain, stalk, and leaf stages of the disease by Burkina Faso, Mali and WASIP-Mali, respectively.
- culture characteristics and coding to be used for identification of races (pathotypes) of *C. graminicola*.
- cross inoculations to be carried out in Mali (National program and WASIP-Mali).

Working Group Meeting on Research Projects

A working group meeting was held at WASIP-Mali on 9 - 10 March 1992. The principal investigators of the projects on *Striga*, long smut, head bugs and wheat/sorghum composite flour presented their latest results. They were evaluated by scientists from the national programs of Mali and Niger, from SAFGRAD's Oversight Committee and WASIP-Mali. It was the second time that a working group was organized for these projects. The principal investigators of the project on grain quality (Niger) and anthracnose (Burkina Faso) could not attend.

SPECIAL MEETING ON *STRIGA*

In accordance with the recommendation made at the 10th steering committee meeting of WCASRN, a special meeting of selected *Striga* researchers was sponsored 11 - 12 March 1992 at WASIP-Mali.

The objectives of the meeting were:

1. To discuss recent results.
2. To develop common research agendas for various aspects of *Striga*.
3. To synthesize observations and results presented.

Participants included *Striga* researchers from the national programs of Senegal, Cameroon, and Burkina Faso and from FAO,

ICRISAT and IRAT/CIRAD, the coordinators of the Pan African *Striga* Network, and the West and Central African Cowpea Research Network were also present.

VISITS TO NATIONAL PROGRAMS

The Coordinator visited the national programs of Burkina Faso, Niger and Nigeria. The major objective of the visits was to hold discussions with the principal investigators of the research projects and to assess progress. A field visit was also made to the head bug project at the Sotuba research station in Mali.

THE TENTH STEERING COMMITTEE MEETING

The meeting was held 12 - 14 November 1991 at the SAFGRAD Coordinating Office in Ouagadougou (Burkina Faso). In addition to the regular members of the committee, observers were present from USAID, INSAH, University of Nairobi, IRAT/CIRAD, SAFGRAD, and ICRISAT. Some of the important decisions were:

- Two types of agronomic trials would be conducted in SAFGRAD member countries.
- A monitoring tour should be organized in 1992.
- An in-service training course on sorghum production and experimentation for technicians would be organized at WASIP-Mali in 1992.
- A regional workshop should be planned for 1993.
- Impact assessment studies for Phase II would be conducted in Cameroon, Nigeria, Burkina Faso, Tchad, Mali, and Togo.

The minutes of the meeting are in the annex of this report.

MINI MONITORING TOUR

A monitoring tour was organized within Mali for representatives from Niger, Nigeria and Tchad on 10 - 12 October 1991. The Coordinator accompanied the group to research stations at Cinzana (240km from Bamako) and Longorola (about 500km from Bamako).

WCASRN sponsored the participation of representatives from Niger and Nigeria to the WASIP-Mali field day held at ICRISAT's facilities at Samanko on 7 - 8 October 1991.

IN-SERVICE TRAINING ON PLANT PROTECTION

In accordance with the decision taken at the 10th steering committee meeting, three representatives from Tchad, Côte d'Ivoire, and Senegal participated in an in-service training course on *Striga*, Entomology and Pathology, respectively. The training course was held at WASIP-Mali on 3 - 12 October 1991 and was supervised by the heads of the three plant protection subprograms.

FINANCIAL SUPPORT TO NARS

Lead NARS - Research Projects

The following payments were made:

- \$ 4000 : Burkina Faso (anthracnose)
- \$ 3000 : Nigeria (wheat/sorghum composite flour)
- \$ 2500 : Cameroon (*Striga*)
- \$ 5000 : Niger (grain quality)
- \$ 4000 : Mali (head bugs)

Non-Lead NARS

The sum of \$ 2000 was sent to each of the following eight countries to support their 1991 activities on sorghum research:

- Central Africann Republic
- Côte d'Ivoire
- Ghana
- Guinea (Conakry)
- Mauritania
- Senegal
- Sierra Leone
- Togo

Financial Reports and Justification of Expenditures

With the exception of the project on grain quality in Niger, financial reports and justification have been received. The second project in Niger on long smut is not mentioned above because the project did not receive financial support in 1991. The reason financial support was not provided to Niger is because justification and supporting documents for the sum of \$ 2500, made available in 1989 at the beginning of the project, was only received in October 1991.

Only eight of the non-lead NARS received \$ 2000 each during 1991. This occurred because the remaining four NARS either did not acknowledge receipt of, or have not justified the \$ 1000 they received in 1990. Of the eight non-lead NARS which received \$ 2000 in 1991, only five have so far accounted for their expenses.

NETWORK IMPACT STUDIES - PRELIMINARY ACTIVITIES

USAID, in conjunction with SAFGRAD, will conduct an impact study during the transition phase of Phase II which will end in December 1992. The Coordinator met with Drs. Schroeder and Bezuneh in Ouagadougou on 10 April for preliminary discussions on the procedures to be adopted during the impact study. Dr. Schroeder works at the USAID Bureau for African in Washington. More details on the impact studies will be provided during this meeting by Drs. Schroeder and Bezuneh.

A questionnaire on the use by national programs of varieties in WCASRN's regional trials was prepared in collaboration with Dr. S.K. Debrah, Principal Economist of WASIP-Mali. The questionnaire has already been sent to collaborators in the 17 member countries of the Network. A copy of the questionnaire can be found at the end of this report. A report on participation of NARS in WCASRN's activities between 1986 and 1991 has been prepared as tables and can also be found at the end of this report.

BROCHURE ON HEAD BUGS

In consultation with SAFGRAD and the Chairman of the Steering Committee, the Coordinator took the initiative to fund the publication of a brochure on sorghum head bugs. This publication is regarded as an off-shoot of the project on head bugs in Mali.

REGIONAL TRIALS AND NURSERIES

1991 Results

The West Africann Sorghum Variety Adaptation Trial, Early Duration (WASVAT-Early) had 14 entries, three of which were controls. These entries were contributed by the national programs of Nigeria, Senegal, Mali, Niger and ICRISAT. The trial was sent to 15 locations in 12 countries; results were received from 11 locations in nine countries. Among the 11 test entries, variety 90 W 186 had the highest mean yield (2.47 t ha^{-1}). One of the control varieties, Nagawhite, had the highest mean yield (2.80 t ha^{-1}) of the 14 entries for 11 locations. Variety 90 W 186 had the highest yield for all 14 entries at three locations: Guiring in Cameroon (6.11 t ha^{-1}), Nyankpala in Ghana (1.72 t ha^{-1}), and Samanko in Mali (5.53 t ha^{-1}) (Annex 4, Table 1). For mean yield across locations for the test entries, the three highest yielding varieties after 90 W 186 were, SSV-2 (2.37 t ha^{-1}), CE 145-66 TRANS 2 (2.26 t ha^{-1}), and CE 314-18 (2.08 t ha^{-1}). Yield data, time to 50% flowering, and plant height for WASVAT-Early are given in Table 1, 2 and 3 respectively, in Annex 4.

With respect to the West Africann Sorghum Variety Adaptation Trial, medium duration (WASVAT-Medium), 15 test entries and two control entries were sent to 18 locations in 14 countries. The entries were from Côte d'Ivoire, Burkina Faso, Ghana, Mali, Nigeria, Benin, Cameroon and ICRISAT. Results were received from 13 locations in 10 countries. Variety S 219 had the highest mean yield (2.33 t ha^{-1}) for all 13 locations for the 15 test entries. S 219 had the highest yield of all 17 entries at Kankan in Guinea (2.06 t ha^{-1}) and at Rokupr in Sierra Leone (0.81 t ha^{-1}). For mean yield across locations, 83-3/3-1-1, 83-3/48-2-1 and Kadaga ranked after S 219 with yields of 2.25 t ha^{-1} , and 2.09 t ha^{-1} , respectively (Annex 4, Table 4). Complete results for WASVAT-Medium are given in Annex 4, Tables 4 to 6.

The West Africann Sorghum Hybrid Adaptation Trial (WASHAT) had 18 entries contributed by ICRISAT and Niger. WASHAT was sent to 14 locations in nine countries. Results were received from 13 locations in nine countries. The hybrid ICSH 89009 NG had the highest mean yield (3.65 t ha^{-1}) for the 13 locations for all 18 entries, followed by ICSH 780 (3.53 t ha^{-1}), ICSH 9005 NG (3.44 t ha^{-1}), and ICSH 507 (3.41 t ha^{-1}). ICSH 89009 NG had the highest yield at Bouake in Côte d'Ivoire (4.8 t ha^{-1}). Yield data, time to 50% flowering and plant height for WASHAT are given in Annex 4, tables 7, 8 and 9, respectively.

The West Africann Sorghum Leaf Disease Nursery (WASLDN) was sent to nine locations in eight countries. Results were received from four locations in four countries. WASLDN had 14 test entries, three susceptible controls to leaf anthracnose, sooty stripe and gray leaf spot and one control with moderate resistance to the three diseases. With respect to leaf anthracnose, F2-20 was resistant at all four locations (score of 3.0 or less in a 1-6 scale). All 14 test entries were resistant to sooty stripe at the two locations which reported the disease. Except for 48887 and ICSV 94-3 BF, all the test entries were resistant to gray leaf spot at the three locations which reported the disease. The resistant control 84 S 82 had a mean disease score of 3.0 or less at all locations for all three diseases. The list of the varieties in WASLDN are given in Annex 4.

The West and Central African Sorghum *Striga* Trial (WCASST) was sent to seven locations in seven countries. Results were obtained from three locations. The trial had 12 entries. Entries with relatively low *Striga* counts were CS 54 X Djigari and CS 141 (1 each) and CS 95 (6) in Cameroon; CS 54 (6), IS 15823 (9), and S 35 (11) in Senegal; and IS 1260 (46) and S 35 (56) in Mali. *Striga* counts in these three locations were between 0.9 and 32 in Cameroon, 6 and 72 in Senegal and 46 and 171 in Mali.

1992 Trials

The same trials with the same entries were sent to the same locations and countries as in 1991. Seeds were multiplied during the off-season and dispatched in early May. The variety NR 71176 in WASVAT-Early was replaced by Nazongala. The quantity of NR 71176 harvested during the off-season was not sufficient.

DIFFICULTIES AND SHORTCOMINGS

Financial Accountability

Financial accountability continues to be a problem with some NARS. For example, of the eight non-lead NARS which received \$ 2000 each for 1991 to support their activities on sorghum, only five have sent financial reports to justify expenses incurred (as of May 1992).

Regional Trials

Stability analyses remain to be performed for the 1986-1990 results. In addition, there has not been a follow-up on the extent to which the NARS have made use of the promising varieties tested in the regional trials and nurseries. In the future, it will be necessary to develop a system for the Coordinator to obtain feed back from NARS.

Reports and Documents in French

This continues to be a problem, considering that 12 of the 17 member countries of WCASRN are French speaking. This difficulty was mentioned in the 1990/91 progress report. The availability of competent personnel with a fairly good knowledge of technical agricultural terminology continues to be a problem.

Visits to Nars

The Coordinator visited Burkina Faso, Niger and Nigeria. Visits to NARS by the Coordinator are important, however this activity should also be shared by steering committee members.

FUTURE PLANS

The research projects will be suspended, except for the project on *Striga* and long smut, as recommended by the steering committee. Both projects will receive \$ 5000 each for 1992. No financial assistance will be given to the non-lead NARS for 1992.

Activities for the remainder of 1992 as recommended by the steering committee include:

- Visits to NARS by the Coordinator and some steering committee members.
- Participation in the regional workshop of the Eastern African Sorghum and Millet Network (EARCAL) by the Coordinator and two steering committee members, scheduled to be held in Sudan in October/November 1992
- The twelfth steering committee meeting will be held in Ouagadougou in October 1992.

ANNEX 1

Research Project Evaluation Form

USAID/OAU-STRC/SAFGRAD/ICRISAT

FORMULAIRE D'EVALUATION/
EVALUATION FORM

PROJETS COLLABORATIFS DE RECHERCHE/
COLLABORATIVE RESEARCH PROJECTS

RESEAU OUEST ET CENTRE AFRICAIN DE RECHERCHE SUR LE SORGHO/
WEST AND CENTRAL AFRICAN SORGHUM RESEARCH NETWORK

(WCASRN)

1. Jusqu'où les objectifs ont été atteints/To what extent have the objectives been achieved:

2. Quelques commentaires sur les methodes et approches/Comments on the method and general approach:

3. Avez-vous des modifications, recommandations ou suggestions à faire/Briefly mention any modifications, recommendations or suggestions for the future:

4. Quelques commentaires sur les questions pratiques des résultats pour l'impact sur l'avenir/Comments on the practical implication of the results for future impact.

() Très pratique/very practical

() Moyennement pratique/average practical implication.

() Non pratique/not practical

5. Comment évaluez-vous le projet en général/Give an overall rating of the project

() Excellent

() Bon/Good

() Moyen/Average

6. Nom du projet/Name of project _____

7. Nom du Chercheur principal/Name of Principal Investigator _____

8. Nom de l'Évaluateur/Name of Evaluator _____

Date _____

ANNEX 2

MINUTES OF THE
10TH STEERING COMMITTEE MEETING

MINUTES OF THE TENTH STEERING
COMMITTEE MEETING

WEST AND CENTRAL AFRICAN SORGHUM RESEARCH NETWORK
(WCASRN)

Ouagadougou, 12-14 November 1991

PARTICIPANTS

1. Y. Ndjekoukosse	Chad	Member
2. S. Da	Burkina Faso	Member
3. R. Kenga	Cameroon	Member
4. Y. Doumbia	Mali	Member
5. M. Sene	Senegal	Member
6. S.N. Lohani	ICRISAT, Mali	Observer
7. O. Ajayi	ICRISAT, Nigeria	Observer
8. P. Salez	IRAT/CIRAD, Mali (ICRISAT, Mali)	Observer
9. G. Hoffman	IRAT/CIRAD (ICRISAT, Mali)	Observer
10. A. Kere	INSAH	Observer
11. J. Menyonga*	SAFGRAD	Observer
12. T. Bezuneh*	SAFGRAD	Observer
13. G. Kingma	USAID	Observer
14. S. Mukuru	EARSAM (ICRISAT Nairobi)	Observer Observer
15. B.W. Mitaru	EARSAM (ICRISAT, Nairobi)	Observer
16. M.D. Thomas	ICRISAT, Mali	Coordinator

* Present at some sessions.

GENERAL

The meeting took place during the joint SAFGRAD steering committee meeting of the maize, cowpea, and sorghum networks. Each network had separate sessions, except for the first day and the closing plenary session (see Annex). In the absence of the substantive chairman M.D. Traoré, S. Da assumed the duties of the chairman for the 10th steering committee meeting. The tentative agenda for the meeting was modified and accepted. By general consensus, R. Kenga and M. Sene were designated English and French rapporteurs, respectively. The minutes of the ninth steering committee meeting were read by the Coordinator, edited and adopted.

COORDINATOR'S REPORT

The report summarized all network activities between the ninth and tenth steering committee meeting and covered aspects as mentioned below.

Research Projects

The principal investigator of the anthracnose project in Burkina Faso had left for further studies in September 1991. Entries in a new regional anthracnose resistance trial came from the project.

Progress of the long smut project in Niger appeared to be slow. Only one technical preliminary report, one complete report in the form of a paper presented at the Inter Network Conference in Niamey in March 1991, and one financial report have been received since 1989. Thus, only half of the amount allocated to the project for 1989 had been paid since the project started.

The sorghum-wheat composite flour project in Nigeria had progressed satisfactorily.

The *Striga* project in Cameroon finally started in 1990. Entries in the 1991 *Striga* regional trial of the network came from that project.

The project in Mali on head bugs had continued in the right direction. The project would have a more regional outlook in 1992 as a multilocational nursery was planned for next year.

No activity had been carried out on the grain quality project in Niger. This was a relatively new project which should have started this year. The project had received half of the amount voted for 1991.

1991 Regional Trials

A list of entries for all six regional trial for 1991 was provided, together with the number of each trial that had been sent to the 17 countries.

Visit to NARS

The Coordinator visited Burkina Faso, Niger and Nigeria.

Monitoring Tour in Mali

Because funds were available and because no monitoring tour had been organized since 1988, the Coordinator took the initiative to invite representatives from Niger, Nigeria, Togo and Central African Republic to visit research stations in Mali. Niger and Nigeria responded to the invitation.

Financial Matters

Financial support of \$ 2000 had been sent to eight non-lead NARS for 1991. A table showing payments to date for the six projects was presented. The budget showed a healthy balance.

Training

Representatives from Chad, Côte d'Ivoire and Senegal participated in an in-service training course on *Striga*, entomology, and pathology, respectively at ICRISAT in Bamako.

Reports and Publications

Nine reports were translated into French. They will be distributed as soon as final editing is completed.

Discussions on the Coordinator's Report

The Chairman informed the Committee that an official letter had been sent to the Coordinator and to the collaborators of the anthracnose project informing them that steps had been taken to ensure that the project continued normally. The Chairman would be involved in the implementation of the project. Further financial support for the long smut project in Niger should await the results of an evaluation of work performed so far. The evaluation should be made by the Coordinator during his next visit to Niger. It was not clear to the Committee why the project on grain quality in Niger had not started. Dr. O. Ajayi was mandated to meet with the principal investigator on his way back to Nigeria. They should try to identify obstacles if any, which had prevented initiation of the project. Dr. Ajayi's report should help the Coordinator to decide on further action. If a negative report is received, the Coordinator should contact potential candidates for the project (Nigeria, Burkina Faso, Mali and Cameroon) and ask them to submit proposals.

In general, the committee observed that there was a lack of communication among scientists working on *Striga*. Five members of the Network, (Burkina Faso, Mali, Senegal, Cameroon, Nigeria) had long been involved in *Striga* research.

Other members of the Steering Committee should visit member countries which the Coordinator was not able to visit. The network is composed of 17 countries and it was noted that the Coordinator alone could not visit all the NARS each year. However, the Coordinator should visit countries where research projects were being carried out.

Some non-lead NARS had acknowledged the amount paid to them in 1991. It was noted that some scientists were not aware of the fact that money had been sent to their programs. It was suggested that those who could not easily receive the funds should contact the Coordinator and indicate the proper channel to follow.

PROGRAM OF ACTIVITIES FOR 1992

If funds are approved for the eighteen months transition phase of SAFGRAD II, the following activities are planned for 1992.

1. Based on a proposition by G. Hoffman, *Striga* agronomist, the Committee suggested that the network should help organize a meeting of selected scientists involved in *Striga* research.
2. A final evaluation of all research projects would be carried out during 1992 and decisions taken accordingly. The Coordinator suggested that 1992 should be considered as the end of the first phase of all projects, except the project on grain quality in Niger.
3. Following a short presentation by P. Salez, two agronomic trials would be conducted in designated SAFGRAD member countries in order to test the response of elite varieties selected by the Network. The two types of trials proposed were intensification (fertilization and soil work) and legume intercropping. The trials would be conducted at six locations. The estimated cost of each trial was 700 000 CFA. The financial implications of these trials would be discussed in December in Mali between P. Salez, the Coordinator and Taye Bezuneh, when the latter visits Mali. A meeting of selected agronomists in the region should be held at ICRISAT-Mali, preferably in January.
4. The Coordinator would visit Cameroon, Niger, Nigeria, Burkina Faso and Senegal. Y. Ndjekoukosse would visit Togo and Central African Republic. M. Sène would visit Côte d'Ivoire and Guinea Bissau.
5. A monitoring tour would be organized. Participants should visit Cameroon and Chad. It was suggested that during the tour, research stations as well as on farm trials should be visited.
6. For 1992, \$ 2000 would be sent to the non-led NARS to support their activities on sorghum research and \$ 1000 to each of the six projects. Since there would be a transition phase, the projects that had continued work during the off-season 1991/92 should receive the second half of the total amount due for 1991, if they had not already received it.
7. An in-service training course on sorghum production and experimentation for technicians would be organized at ICRISAT in Mali. Mali researchers in the national program would come from selected countries based on previous participation in training courses. The Coordinator should write to the selected countries indicating the course description and duration.
8. A working group meeting of all projects would be held in Ouagadougou on 2 - 4 March 1992. The eleventh Steering Committee meeting would follow the working group meeting.
9. The twelfth Steering Committee meeting was scheduled for 9-11 November 1992 at ICRISAT in Kano, Nigeria.

GENERAL MATTERS

The procedure for electing members to the Steering Committee was reviewed. It was suggested that members be elected on the basis of their scientific ability and not on country basis. It is preferable to elect scientists from different backgrounds.

The Committee proposed that a regional sorghum workshop be planned for 1993. The Coordinator should notify each country as early as possible. During the workshop, emphasis would be placed on scientific papers.

Impact assessment studies would be organized by the SAFGRAD Coordinating Office during 1992. For WCASRN, six countries were selected for this study. They were Cameroon, Nigeria, Burkina Faso, Chad, Mali and Togo. Except for Togo, these countries are represented in the Steering Committee. The Coordinator and SAFGRAD Director of Research would consult each other with respect to the three individuals who would sent their comments later to SAFGRAD's Director of Research, especially on the parameters listed for the study.

INSAH and WCASRN could not conduct a joint on-station regional trial in 1991 as had been suggested at the eighth Steering Committee meeting. The trial would have included six promising varieties from WCASRN. INSAH was now at the level of on-farm testing and the observer from INSAH informed the Committee that some of the six promising varieties from WCASRN, such as Malisor 84-1, CE 180-83 and ICSV 1063 BF, had already been included in their on-farm trials. The Committee felt that more interaction was needed between INSAH and WCASRN. The observer from INSAH expressed his appreciation with respect to invitations from WCASRN to attend Steering Committee meetings.

Finally, the Chairman thanked all the Steering Committee members for their good collaboration and the Coordinator for a job well done. He then wished all participants a safe journey back home.

ANNEX

TENTH STEERING COMMITTEE MEETING

WEST AND CENTRAL AFRICAN SORGHUM RESEARCH NETWORK (WCASRN)

Ouagadougou, 11-14 November 1991

The SAFGRAD Coordinating Office (SCO) in Ouagadougou invited the three Maize, Cowpea, and Sorghum Networks to hold their tenth Steering Committee meetings at Ouagadougou, 11-14 November, 1991. This permitted a joint session of all three Steering Committees to discuss the USAID evaluation of Phase II of the SAFGRAD Project, the proposed transition period of 18 months beginning in January 1992, and the impact studies to be carried out on the three networks by SCO during the transition period.

The first day (11 November) was set aside for the joint session of all the three networks. At the opening ceremony, which was chaired by SAFGRAD's International Coordinator, speeches were made by representatives from USAID, (Wilbur Thomas), IITA (E.F. Deganus), ICRISAT (O. Ajayi) and SAFGRAD's Oversight Committee (Mercer-Quashie). The opening speech was given by the Director General of Research in Burkina Faso (M. Sodogo). SAFGRAD's Director of Research then presented a paper on the evaluation of SAFGRAD II by USAID, which was followed by discussions.

SAFGRAD's Director of Research presented a second paper in the afternoon session on future activities of SAFGRAD Networks. This paper emphasized the impact studies that SAFGRAD wished to undertake during the 18 months transition phase. A lengthy discussion followed this presentation.

There was a final plenary session of all the networks in the morning of 14 November, chaired by SAFGRAD's International Coordinator. The reports from each of the three networks were read by the respective rapporteurs. A short discussion followed and a point was raised concerning activities planned by WCASRN for 1992. The WCASRN Coordinator responded that activities were planned based on the assumption that the 18 month budget presented to SAFGRAD through ICRISAT would be approved by USAID. It was pointed out that this was not made clear in the WCASRN report. The report was then modified accordingly. In this connection, the representative from USAID (G. Kingma) informed the meeting that no decision had been made by USAID on funding for the transition period.

Closing remarks were made by a representative from IITA (E. Deganus) and by the Chairman, J. Menyonga.

ANNEX 3

1. Questionnaire on use of varieties
2. Participation of NARS in Network Activities (in Tables)

RESEAU OUEST ET CENTRE AFRICAIN DE RECHERCHE SUR LE SORGHO (ROCARS)

WEST AND CENTRAL AFRICAN SORGHUM RESEARCH NETWORK (WCASRN)

Questionnaire sur l'utilisation des Variétés
dans les Programmes Nationaux

Questionnaire on the use of Varieties in
National Programs

1. Nom/Name _____

2. Adresse/Address _____

3. Raison sociale/Institute _____

4. Votre spécialité/Your discipline _____

Première partie/Part One

5. Avez-vous conduit les essais régionaux de Rocars/Have you conducted any WCASRN regional trials?

Oui/yes _____ Non/No _____

Si oui, quels essais et quelles années/If yes, which trials and in which years.

<u>Essai/Trial</u>	<u>Année/Year</u>
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____

Tableau pour la question n°7/ *Table for question n°7*

Variété/ <i>variety</i>	Niveau d'utilisation/ <i>Level of use</i>	Année/ <i>year</i>	Oui ou non/ <i>yes or no</i>		
			No. d'hectare <i>No. of hecta.</i>	Station	Milieu Paysan/ <i>on farm</i>
1. _____	_____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____	_____
6. _____	_____	_____	_____	_____	_____
7. _____	_____	_____	_____	_____	_____
8. _____	_____	_____	_____	_____	_____
9. _____	_____	_____	_____	_____	_____
10. _____	_____	_____	_____	_____	_____
11. _____	_____	_____	_____	_____	_____
12. _____	_____	_____	_____	_____	_____
13. _____	_____	_____	_____	_____	_____
14. _____	_____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____	_____

6. Avez-vous utilisé des variétés de ces essais dans votre programme national/*Have you used any varieties from these trials in your national program.*

Oui/yes _____

Non/No _____

7. Si vous repondez "oui" à la question n°6, veuillez remplir le tableau à la page 3 où le niveau d'utilisation comprend votre propre programme de recherche, le programme d'un collègue, test en milieu paysan, pré-vulgarisation, vulgarisé.

If your answer to n° 6 is yes, complete the table on page 3 where level of use includes your own research program, a research program of a colleague, on-farm testing, pre-release, and released.

8. Comment faites-vous pour avoir les semences des variétés mentionnées dans le tableau à la page 3/*How do you get the seeds of the varieties mentioned in the table on page 3.*

- Vous les multipliez vous-même.	Oui _____	Non _____
<i>You multiply them yourself.</i>	Yes _____	No _____
- Votre institut les multiplie.	Oui _____	Non _____
<i>Your institute multiplies them.</i>	Yes _____	No _____
- Une agence du gouvernement.	Oui _____	Non _____
<i>A government agency.</i>	Yes _____	No _____
- Une entreprise privée.	Oui _____	Non _____
<i>A private company.</i>	Yes _____	No _____

DEUXIEME PARTIE/PART TWO

Le sous-programme agroéconomie collecte des informations sur l'impact variétal et les modes d'utilisation du sorgho dans votre pays. Ces informations serviront à la sélection de pays pour une étude approfondie. Veuillez remplir les tableaux ci-dessous.

Questionnaire sur l'impact variétal.

Indiquez les services ou autres personnes où des compléments d'information peuvent être obtenus.

Variété	Origine	Superficie couverte	Zone ou région où la variété est le plus utilisé	Autres Services	Autres personnes de contact

Questionnaire sur l'utilisation du sorgho

Le sorgho est le plus souvent utilisé pour la préparation d'aliments et de boissons (alcoolique ou non alcoolique) dans plusieurs pays. Donnez dans le tableau ci-dessous les informations demandées.

Variété	Couleur	Variété utilisée le plus souvent pour:		Indiquez la région de grande production de boisson à base de sorgho concernée
		Préparation aliments	Préparation boisson	

The economic sub-program is seeking preliminary information on sorghum varietal impact as well as its utilization pattern in your country. The information will be used as a basis for country selection for an in-depth study. Kindly provide the information in the tables below:

Varietal impact questionnaire

Please complete the table below on the most common varieties grown in your country

Further information may be obtained from:

Variety	Origin	Approximate area covered (ha)	Region or Zone where variety mostly grown	Agency	Contact person

Sorghum Utilization Questionnaire

Sorghum is used mostly for the preparation of a variety of food products as well as beverages (alcoholic or non-alcoholic) in many countries. Please provide the necessary information in the table below:

Variety	Colour	Mostly used for :		For beverage preparation indicate region or zone of high production
		Food products	Beverages	

Retourner avant le 30 Juin 1992 à /return before June 30, 1992 to
Dr. Melville D. Thomas
ICRISAT Regional Program
B.P. 320
Bamako
Mali.

USAID/SAFGRAD/OAU-STRC/ICRISAT

West and Central African Sorghum Research Network

(WCASRN)

Grant N°698-0452-G-00-6023-00

PARTICIPATION OF NATIONAL AGRICULTURAL
RESEARCH SYSTEMS (NARS)
IN NETWORK ACTIVITIES

1986-1991

International Crops Research Institute for the Semi-Arid Tropics
(ICRISAT)

West and Central African Sorghum Research Network

B.P. 320, Bamako, Mali

TABLE OF CONTENTS

Table 1:	Training
Table 2:	Monitoring Tours
Table 3:	Regional Workshops
Table 4:	Steering Committee Meetings
Table 5:	Visits to NARS
Table 6:	Percentage of Varieties Contributed
Table 7:	Number of Trials dispatched and Number of Results Received
Table 8:	Working Group Meetings on Research Projects.
Table 9:	Special Meeting on <i>Striga</i>

TABLE 1. TRAINING

Type	Location	Year	Date	N° of days	Participants	
					Number	No of countries ¹
1. <i>Striga</i> Control	Ouagadougou	1987	5-10 Oct	6	12	11
2. Agronomy/on-Farm Testing	Bamako	1989	9-29 Sept	21	9	9
3. Plant Protection	Bamako	1991	3-12 Oct	10	3	3

1. For *Striga*: Burkina Faso, Cameroon, Gambia, Ghana, Kenya, Mali, Niger, Nigeria, Sudan, Togo, Uganda.

For Agronomy: Côte d'Ivoire, Gambia, Ghana, Guinea Bissau, Mauritania, Niger, Nigeria, Senegal, Sierra Leone.

For Plant Protection: Tchad, Côte d'Ivoire, Senegal on *Striga*, entomology and Pathology, respectively.

TABLE 2. MONITORING TOURS

Countries visited	Year	Date	No of days	Participants	
				Number	No. of countries
1. Cameroon Gambia Nigeria Senegal	1986	23 Sept - 6 Oct	14	6	6
2. Burkina Faso	1986	3-16 Oct	4	5	5
3. Burkina Faso	1987	30 Sept - 3 Oct	4	11	11
4. Mali Burkina Faso Niger	1988	9-18 Oct	10	7	7
5. Mali	1991	10-12 Oct	3	3	3

1. 1986 (1) : Benin, Central Africann Republic, Gambia, Mauritania, Nigeria, Senegal.
 1986 (2) : Ghana, Guinea Bissau, Mali, Niger, Sierra Leone.
 1987 : Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Gambia, Niger, Nigeria, Senegal, Togo, Mali.
 1988 : Benin, Burkina Faso, Cameroon, Guinea, Mali, Chad, Togo.
 1991 : Niger, Nigeria, Tchad.

TABLE 3. REGIONAL WORKSHOPS

Location ¹	Year	Date	No of days	Participants	
				Number	No of countries ²
Cameroon	1988	20-23 Nov	4	52	14
Niamey	1991	7-14 March	8	20	16

1. Cameroon and Nigeria were the third and fourth workshops. The first and second workshops in 1984 and 1985, fall outside the period under review.

TABLE 4. STEERING COMMITTEE MEETING

Location	Year	Date	No of days	Participants from NARS as	
				Member ¹	Observer ²
1. Ouagadougou, Burkina Faso	1986	13-14 Jan	2	2	1
2. Ouagadougou, Burkina Faso	1987	10-11 March	2	3	1
3. Ouagadougou, Burkina Faso	1987	15-17 Dec	3	4*	1
4. Maroua, Cameroon	1988	24 Sept	1	6*	2
5. Bamako, Mali	1989	9-11 May	3	4*	0
6. Ouagadougou, Burkina Faso	1989	14-17 Nov	4	5*	1
7. Niamey, Niger	1990	2-4 May	3	6*	1
8. Bamako, Mali	1990	3-4 Dec	2	3*	0
9. Niamey, Niger	1991	13-14 March	2	5	0
10. Ouagadougou, Burkina Faso	1991	12-14 Nov	3	5	1

1. *: indicates members and includes individuals from outside the region, but with NARS on special projects as follows:
1987 = 1; 1988 = 3; 1989, May = 2; 1989, Nov = 2; 1990, May = 2; 1990, Dec = 1.
2. Observers are individuals from NARS. Observers from International and regional organizations are not included.

TABLE 5. VISITS TO NARS¹

Made by Country ¹	Countries visited	Year	Date	No of days
Mali	Senegal Gambia	1989	5/9-16/9	8
Nigeria	Ghana	1990	18/8-27/8	10
Burkina Faso	Benin	1990	28/9-6/10	10

1. Countries of the Steering Committee members who assisted the Coordinator in visiting the weaker NARS.

TABLE 6. PERCENTAGE OF VARIETIES CONTRIBUTED BY NARS TO REGIONAL TRIALS

Year	Trial ¹	Total number of test entries	Test entries from NARS	
			Number ²	Percent
1986	WASVAT-E	18	0	0
	WASVAT-M	18	0	0
	WASHAT	30	0	0
1987	WASVAT-E	18	6	33
	WASVAT-M	18	7	39
	WASHAT	22	0	0
	WASLDN	36	0	0
1988	WASVAT-E	18	5	28
	WASVAT-M	18	7	39
	WASHAT	18	0	0
	WASLDN	36	0	0
	WCASST	11	1	9
1989	WASVAT-E	17	6	35
	WASVAT-M	17	10	59
	WASHAT	17	2	12
	WASLDN	25	0	0
	WCASST	11	1	9
1990	WASVAT-E	17	6	35
	WASVAT-M	17	10	59
	WASHAT	18	2	11
	WASDLN	25	0	0
	WCASST	11	1	9
1991	WASVAT-E	11	8	73
	WASVAT-M	15	8	53
	WASHAT	-	-	-
	WASLDN	14	6	43
	WCASST	12	12	100

1. WASVAT-E: West African Sorghum Variety Adaptation Trial, Early Maturing Cycle. M= Medium cycle. WASHAT: West African Sorghum Hybrid Adaptation Trial. WASLDN: West African Sorghum Leaf Disease Nursery. WCASST: West and Central African Sorghum *Striga* Trial.

2. Rest of test entries were contributed by ICRISAT.

TABLE 7. NUMBER OF TRIALS DISPATCHED
AND NUMBER OF RESULTS RECEIVED

Year	Trial ¹	Dispatched	Results received	
			Number ²	Percentage
1986	WASVAT-E	7	7	100
	WASVAT-M	8	8	100
	WASHAT	14	12	86
1987	WASVAT-E	10	9	90
	WASVAT-M	13	12	92
	WASHAT	15	15	100
	WASLDN	5	5	100
1988	WASVAT-E	14	12	86
	WASVAT-M	19	13	68
	WASHAT	12	12	100
	WASLDN	7	7	100
	WCASST	6	3	50
1989	WASVAT-E	16	12	75
	WASVAT-M	19	13	68
	WASHAT	9	8	89
	WASLDN	10	2	20
	WCASST	9	6	67
1990	WASVAT-E	15	13	87
	WASVAT-M	19	13	68
	WASHAT	10	10	100
	WASDLN	8	4	50
	WCASST	11	3	27
1991	WASVAT-E	15	11	73
	WASVAT-M	18	12	67
	WASHAT	14	-	-
	WASLDN	9	3	33
	WCASST	6	1	17

1. WASVAT-E: West African Sorghum Variety Adaptation Trial, Early Maturing Cycle. M= Medium cycle. WASHAT: West African Sorghum Hybrid Adaptation Trial. WASLDN: West African Sorghum Leaf Disease Nursery. WCASST: West and Central African Sorghum *Striga* Trial.

2. Rest of test entries contributed by ICRISAT.

TABLE 8. WORKING GROUP MEETING ON RESEARCH PROJECTS

Working group	Location	Year	Date	Number of days	Participants from NARS ¹
1. Pathology-Entomology	Bamako, Mali	1990	19-20 April	2	5
2. Grain Utilization	Zaria, Nigeria	1990	13 Sept	1	4
3. <i>Striga</i>	Niamey, Niger	1991	10 March	1	5
4. All projects	Bamako, Mali	1992	9-10 March	2	11

1. Participants from NARS were either the principal investigator(s) of the research projects or individuals invited as evaluators. The principal investigators of the projects on anthracnose (Burkina Faso) and grain quality (Niger) were absent in 1992.

TABLE 9. SPECIAL MEETING ON *STRIGA*

Location:	Bamako
Date:	10-11 March, 1992
Number of days:	2
Participants from NARS:	3
Objective:	Discuss results and develop a common research agenda.
Observers:	FAO, PASCON, SAFGRAD, ICRISAT, IRAT/CIRAD.

ANNEX 4

1991 Regional Trials

1. Trial Results Tables 1 to 9
2. Number of Trials and Results
3. Regional Trials and Originating
Programss

Table 1. Mean grain yield (t ha⁻¹) of early duration varieties in the West African Variety Adaptation Trial (WASVAT-Early) at 11 locations, rainy season 1991¹

Variety	1	2	3	4	5	6	7	8	9	10	Mean
90 W 186	3.31	4.55	6.11	1.72	3.50	0.76	0.14	0.77	0.75	5.53	2.47
SSV-2	3.70	4.76	5.08	1.38	3.50	0.93	0.42	1.74	0.80	3.76	2.37
CE 145-66 TRANS 2	3.39	4.08	4.52	1.64	4.24	0.90	0.98	1.46	0.59	3.04	2.26
CE 314-18	2.43	3.22	5.36	1.23	3.13	0.73	1.00	1.98	0.59	3.18	2.08
CE 315-14-1-1	0.86	3.24	4.94	1.38	3.48	1.36	0.45	1.56	0.67	2.80	1.88
90 W 194	2.87	3.46	3.59	0.81	3.21	1.49	0.40	0.61	0.58	3.60	1.87
90 W 197	2.86	3.70	5.35	0.65	3.71	0.93	0.16	0.56	0.55	1.22	1.79
CSM 219	3.31	3.19	5.40	0.92	3.34	1.14	0.49	0.91	0.66		1.76
NR 71176	1.91	3.75	2.50	0.49	3.03	1.01	0.84		0.58	2.96	1.55
Mota Maradi	0.31	3.35	3.61	0.88	2.30	0.47	0.92	1.35	0.37	2.33	1.44
NR 761176	0.65	2.83	2.38	0.40	2.54	0.55	0.46	0.42	0.60	3.20	1.27
Control											
ICSV401 IN	1.64	3.09	2.01	0.99	1.83	0.29	1.32	0.36	0.52	1.33	1.22
Nagawhite	5.03	4.56	5.80	1.30	4.10	1.47	0.42	2.10	0.58	5.42	2.80
Local	3.20	3.51	4.01	1.68	2.71	1.01	0.87	1.17	0.47	3.91	2.05
SE											
Mean	0.39	0.45	0.46	0.13	0.35	0.10	0.10	0.15	0.06	0.40	
CV (%)	22	13	25	36	17	53	73	61	28	33	

1 = Farako-Bô; 2 = Saria, in Burkina Faso; 3 = Guiring in Cameroon; 4 = Nyankpala in Ghana; 5 = Cinzana in Mali; 6 = Kaedi in Mauritania; 7 = Maradi in Niger; 8 = Bambe in Senegal; 9 = Rokupr in Sierra Leone; 10 = Samanko in Mali.

Table 2. Mean number of days to 50% flowering of early duration varieties in the West African Variety Adaptation Trial (WASVAT-Early) at 11 locations, rainy season, 1991¹.

Variety	1	2	3	4	5	6	7	8	9	10	11	Mean
NR 71176	72	61	82	66	75	77	77	61	-	73	76	72
NR 71169	72	61	77	64	67	81	74	61	-	86	80	72.3
CE 145-16(2)	69	61	64	60	67	80	71	65	-	75	66	67.8
CE 314-18	67	59	67	59	69	72	71	58	-	68	68	65.8
CE 315-14-1-1	68	62	60	58	66	77	76	61	-	69	66	66.3
SSV-2	71	63	67	60	68	78	78	60	-	71	67	68.6
CSM 219	78	66	69	66	-	83	84	70	-	78	77	74.5
Mota Maradi	58	54	57	51	53	67	62	52	-	64	67	58.6
90 W 194	72	68	68	62	70	79	79	68	-	75	69	71.00
90 W 186	72	66	67	61	68	81	81	66	-	78	67	70.7
90 W 197	77	66	79	67	69	84	75	68	-	82	80	74.7
Control												
ICSV 401 IN	77	55	74	65	75	75	69	72	-	79	68	70.9
Nagawhite	69	61	62	55	62	74	73	59	-	70	67	65.2
Local	71	53	59	62	72	68	59	61	-	73	109	68.7
SE	±1.5	±4.0	±4.1	±1.8	±5.3	±1.9	±2.6	±1.0	-	±3.4	±2.3	
Mean	71	61	68	61	68	77	73	63	-	74	73	
CV (%)	3	8	7	2	10	3	4	2	-	6	4	

1. 1=Farako-Ba; 2=Saria, in Burkina Faso; 3=Nyankpala in Ghana; 4=Cinzana, 5=Samanko, in Mali; 6=Kaedi in Mauritania; 7=Maradi in Niger; 8=Guiring in Cameroon; 9=Samaru in Nigeria; 10=Bambey in Senegal; 11=Rokupr in Sierra Leone.

Table 3. Mean plant height (m) of early duration varieties in the West African Variety Adaptation Trial (WASVAT-Early) at 11 locations, rainy season, 1991¹.

Variety	1	2	3	4	5	6	7	8	9	10	11	Mean
NR 71176	1.6	1.6	1.5	1.6	1.7	1.5	1.2	1.6	-	1.5	1.4	1.5
NR 71169	1.6	1.5	1.5	1.7	1.4	1.3	1.1	1.4	-	1.0	1.2	1.3
CE 145-16(2)	2.2	2.2	1.8	2.0	1.7	1.5	1.5	1.9	-	1.5	1.3	1.7
CE 314-18	1.9	1.9	1.8	2.1	1.6	1.7	1.4	1.9	-	1.6	1.4	1.7
CE 315-14-1-1	1.9	2.1	1.8	2.1	1.6	1.6	1.5	2.3	-	1.6	1.2	1.7
SSV-2	2.3	2.5	2.0	2.3	1.8	1.9	1.7	2.2	-	1.4	1.3	1.9
CSM 219	2.3	2.8	2.1	2.2	-	1.6	1.7	2.2	-	1.7	1.4	2
Mota Maradi	2.3	2.7	2.1	2.5	2.2	2.3	2.3	2.6	-	1.8	1.1	2.1
90 W 194	2.4	2.4	2.1	2.4	2.0	2.0	1.6	2.3	-	1.5	1.4	2.01
90 W 186	2.4	2.7	2.3	2.6	2.0	1.9	2.0	2.7	-	1.7	1.4	2.1
90 W 197	2.6	2.6	2.3	2.6	2.3	1.9	1.9	2.5	-	1.8	1.8	2.2
Control												
ICSV 401 IN	2.3	2.3	1.8	1.9	1.7	1.8	1.5	1.9	-	1.3	1.3	1.7
Nagawhite	2.2	2.3	1.8	2.2	1.9	1.8	1.7	2.1	-	1.6	1.3	1.8
Local	3.7	1.8	2.9	3.5	3.5	1.4	1.8	2.1	-	1.2	2.8	2.07
SE	±0.11	±0.19	±1.30	±1.80	±0.11	±1.12	±0.14	±0.15	-	±0.23	±0.12	
Mean	2.3	2.2	2.0	2.2	1.9	1.7	1.6	2.1	-	1.2	1.5	
CV (%)	6	10	8	6	7	9	10	9	-	19	10	

1. 1=Farako-Ba; 2=Saria, in Burkina Faso; 3=Nyankpala in Ghana; 4=Cinzana, 5=Samanko, in Mali; 6=Kaedi in Mauritania; 7=Maradi in Niger; 8=Guiring in Cameroon; 9=Samaru in Nigeria; 10=Bambey in Senegal; 11=Rokupr in Sierra Leone.

Table 4. Mean grain yield (t ha⁻¹) medium duration varieties in the West African Variety Adaptation Trial (WASVAT-Medium) at 12 locations, rainy season, 1991¹.

Variety	1	2	3	4	5	6	7	8	9	10	11	Mean
S 219	0.78	3.39	4.34	4.87	1.10	2.06	2.45	0.66	2.59	0.81	2.62	2.33
83-3/3-1-1	0.55	4.25	3.74	3.98	1.46	1.48	2.47	0.77	2.76	0.54	2.77	2.25
83-3/48-2-1	0.82	3.39	3.22	3.58	1.90	0.96	2.60	0.21	3.34	0.64	2.44	2.10
Kadaga	0.54	3.15	2.94	4.69	1.14	1.21	2.56	0.61	3.01	0.68	2.45	2.09
CSM 388	0.73	3.31	3.97	3.94	0.45	1.55	2.22	0.48	3.14	0.78	2.27	2.08
NR 71158	0.68	3.33	3.41	3.49	0.74	1.67	2.64	0.73	2.78	0.60	2.65	2.07
NR 71149	1.12	3.02	3.25	4.23	0.76	1.77	2.16	0.50	2.66	0.76	2.15	2.03
Blanc de Bagou	0.73	2.66	3.72	2.32	0.79	1.68	2.24	0.72	3.47	0.71	2.23	1.93
90 W 187	0.73	1.85	3.33	4.31	0.59	1.04	2.36	0.50	3.20	0.57	2.24	1.88
90 W 188	0.34	2.87	3.79	3.28	0.99	0.65	1.78	0.49	2.82	0.57	1.91	1.77
90 W 190	0.39	2.40	3.11	3.51	0.21	1.08	1.60	0.46	2.43	0.73	2.11	1.64
90 W 191	0.49	3.38	1.91	2.35	0.76	1.71	2.89	0.18	1.78	0.42	1.78	1.60
90 W 193	0.67	1.17	3.31	3.11	0.89	0.81	1.47	1.12	2.39	0.56	2.06	1.60
90 W 195	0.48	0.63	2.43	1.41	0.45	1.48	1.98	0.43	2.32	0.61	1.11	1.21
90 W 196	0.33	0.00	0.00	0.27	0.02	0.00	0.07	1.04	0.00	0.36	0.44	0.23
Control												
CS 85	0.40	3.00										
Local	0.73	3.49	3.94	4.20	0.11	0.69	1.78	0.27	3.24	0.52	1.59	1.80
			4.78	5.10	0.33	0.82	3.53	0.67	3.67	0.80	1.87	2.35
SE	0.6	2.66										
Mean			3.25	3.45	1.22	1.22	2.16	0.58	2.68	0.63	2.04	
CV (%)												

1=Ina in Benin; 2=Farako-Bâ, 3=Saria in Burkina Faso; 4=Guiring in Cameroon; 5=Nyankpala in Ghana; 6=Kankan in Guinea; 7=Samanko in Mali; 8=Kolo in Niger; 9=Niro in Senegal; 10=Rokupr in Sierra Leone; 11=Samanko in Mali.

Table 5. Mean number of days to 50% flowering of medium duration varieties in the West African Variety Adaptation Trial (WASVAT-Medium) at 12 locations, rainy season, 1991¹

Variety	1	2	3	4	5	6	7	8	9	10	11	12	Mean
S 219	73	62	68	53	65	-	61	67	71	63	66	66	65
83-3/3-1-1	76	74	78	59	74	-	70	75	90	74	72	74	74.1
83-3/48-2-1	79	76	82	63	80	-	72	76	95	72	77	75	77
Kadaga	65	62	65	55	66	-	60	62	69	59	64	69	63.2
CSM 388	78	88	84	69	80	-	78	77	97	69	88	55	78.4
NR 71158	79	66	78	61	80	-	70	75	73	76	74	84	74.1
NR 71149	78	71	79	59	80	-	70	79	73	76	73	82	74.5
Blanc de Bagou	113	147	103	103	116	-	101	109	120	87	108	109	110.5
90 W 187	82	79	89	67	90	-	77	80	94	77	79	81	81.3
90 W 188	82	82	90	68	90	-	79	81	97	78	81	72	81.8
90 W 190	80	81	88	65	89	-	78	80	95	76	79	79	80.9
90 W 191	82	77	87	67	85	-	77	81	96	73	77	77	79.9
90 W 193	83	82	83	65	86	-	78	81	89	77	78	80	80.1
90 W 195	81	79	88	68	86	-	78	80	94	78	78	77	80.6
90 W 196	80	74	88	66	88	-	78	80	98	77	78	79	80.5
Control													
CS 85	82	73	88	63	107	-	79	81	71	78	73	85	80
Local	78	71	79	58	97	-	80	78	76	74	75	99	78.6
SE	±1.5	±3.8	±3.9	±2.0	±1.5	-	±3.7	±1.2	±4.1	±3.4	±3.3	±9.2	
Mean	81	79	83	65	86	-	76	79	88	74	78	79	
CV (%)	2		6	4	2	-	6	2	6	6	5	14	

1. 1=N'Dali in Benin; 2=Saria, 3=Farako-Bâ in Burkina Faso; 4=Guiring in cameroon; 5=Nyankpala in Ghana; 6=Kankan in Guinea; 7= Samanko-PAR; 8=Samanko-ICRISAT in Mali; 9=Kolo in Niger; 10=Samaru in Nigeria; 11= Nioro in Senegal; 12=Rokupr in Sierra Leone; - = missing data.

Table 6. Mean plant height (m) of medium duration varieties in the West African Variety Adaptation Trial (WASVAT-Medium) at 12 locations, rainy season, 1991¹

Variety	1	2	3	4	5	6	7	8	9	10	11	12	Mean
													n
S 219	1.6	3.1	2.5	2.7	2.4	1.2	2.8	2.4	1.9	1.5	2.8	1.2	2.02
83-3/3-1-1	1.5	2.3	1.9	1.9	1.9	1.3	2.2	1.9	1.7	1.6	2.0	1.2	1.78
83-3/48-2-1	1.5	2.7	2.5	2.6	2.1	1.6	2.4	2.3	1.5	1.7	2.4	1.3	2.05
Kadaga	2.1	3.8	2.7	3.2	2.4	1.5	3.2	2.8	2.5	1.6	3.2	1.5	2.54
CSM 388	2.7	4.7	4.2	4.9	3.6	2.3	4.2	3.9	2.8	2.1	4.5	2.1	3.5
NR 71158	1.4	1.8	1.6	1.6	2.4	1.1	1.7	1.6	1.3	1.2	1.8	1.3	1.5
NR 71149	1.2	1.6	1.6	1.6	1.5	1.2	1.7	1.4	1.1	1.2	1.7	1.4	1.4
Blanc de Bagou	4.1	4.1	4.9	4.9	3.7	2.9	4.8	4.4	3.6	-	-	2.6	3.9
90 W 187	2.1	2.8	2.8	3.1	2.4	1.5	3.0	2.6	2.0	1.7	2.6	1.4	2.3
90 W 188	2.1	2.9	2.9	2.5	2.5	1.6	2.8	2.5	1.8	1.6	2.6	1.7	2.29
90 W 190	2.1	2.9	2.8	2.9	2.5	1.8	3.1	2.6	1.8	1.7	2.6	1.5	2.3
90 W 191	1.8	2.9	2.9	2.5	2.5	1.6	2.9	2.5	1.8	1.9	2.4	1.7	2.28
90 W 193	2.1	2.9	2.9	2.9	2.9	1.5	3.1	2.6	1.8	1.7	2.7	1.7	2.15
90 W 195	2.1	3.1	3.1	3.1	3.0	1.8	3.1	2.8	2.0	1.8	2.7	1.8	2.53
90 W 196	2.1	2.8	2.9	2.9	2.9	1.8	3.1	2.7	1.8	1.7	2.7	1.7	2.42
Control													
CS 85	2.3	2.8	3.0	2.8	2.5	1.5	2.9	2.6	1.8	1.7	2.6	1.7	2.35
Local	1.7	3.3	3.8	2.3	3.4	1.5	4.2	3.9	1.4	1.2	2.2	3.3	2.68
SE	±0.14	±0.20	±0.14	±0.20	±0.01	±0.22	±0.09	±0.09	±0.14	±0.13	±0.07	±0.26	
Mean	2.0	2.9	2.9	2.9	2.6	1.6	3.0	2.7	1.9	1.6	2.6	1.7	
CV (%)	9	8	6	9	1	17	4	4	9	10	3	18	

1. 1=N'Dali in Benin; 2=Saria, 3=Farako-Bâ in Burkina Faso; 4=Guiring in Cameroon; 5=Nyankpala in Ghana; 6=Kankan in Guinea; 7=Samanko-PAR; 8=Samanko-ICRISAT in Mali; 9=Kolo in Niger; 10=Samaru in Nigeria; 11=Nioro in Senegal; 12=Rokupr in Sierra Leone; - = missing data.

Table 7. Mean grain yield (t ha⁻¹) of test hybrids in the West Adaptation Trial (WASHAT) - 1991 conducted at 13 locations West African¹.

Entry	Nigeria	Nigeria	Senegal	Côte d'Ivoire		Mali	Mali	B. Faso	Cameroon	Ghana	Benin	Niger	Niger	Mean
	Zaria	Bagauda	Bambey	Bouaké	Ferké	Samanko	Cinzana	FarakoBâ	Maroua	Nyankapala	N'Dali	Tilebery	Maradi	
ICSH 89009 NG	3.33 4	6.10 3	3.68 3	4.88 1	1.19 2	2.92 7	2.93 9	5.70 3	4.69 9	1.38 11	2.87 2	4.11 5	0.41 16	3.65
ICSH 780	3.42 3	6.22 2	3.31 6	4.13 6	1.27 1	3.48 2	2.81 12	5.83 1	5.17 3	1.49 8	2.35 9	2.88 17	1.54 2	3.53
ICSH 90005 NG	2.76 7	5.94 4	3.27 7	3.73 11	0.67 12	2.91 8	3.08 6	5.63 5	4.97 4	1.53 7	2.56 5	4.22 3	1.06 7	3.44
ICSH 507	2.44 10	5.62 6	3.59 4	3.83 9	1.02 5	2.67 12	3.36 4	5.78 2	6.00 1	1.35 12	2.50 7	2.71 19	0.73 14	3.41
ICSH 89002 NG	2.71 8	6.36 1	2.49 13	4.23 5	1.02 5	3.19 5	3.36 4	5.55 7	4.88 5	1.26 13	2.91 1	2.94 16	0.33 17	3.41
ICSH 89007 NG	2.58 9	5.90 5	3.10 8	4.08 7	0.90 8	2.43 15	3.44 3	5.34 8	4.22 14	1.86 3	2.84 4	4.18 4	0.83 11	3.41
ICSH 90003 NG	3.51 2	5.59 7	4.08 1	4.71 2	1.04 4	2.61 14	3.19 5	3.83 14	4.73 8	1.19 15	2.54 6	3.21 13	1.11 6	3.40
ICSH 89012 NG	2.98 6	5.55 8	3.35 5	3.75 10	1.19 2	2.24 17	2.65 15	5.60 6	4.45 12	1.99 1	2.35 9	3.88 6	0.33 18	3.33
ICSH 90004 NG	2.31 11	2.67 19	2.94 10	3.50 12	0.65 13	3.62 1	2.83 11	4.82 9	5.22 2	1.44 9	2.85 3	3.39 11	0.83 11	3.27
ICSH 89001 NG	2.04 13	5.43 9	2.78 12	4.29 4	1.04 4	3.33 3	2.75 13	4.69 10	4.58 11	1.00 18	2.14 14	4.53 2	1.36 3	3.22
ICSH 89004 NG	3.56 1	5.55 8	2.78 12	3.33 13	1.00 6	2.74 9	3.50 1	4.32 11	4.23 13	1.78 4	2.13 15	3.60 7	1.12 5	3.21
ICSH 90002 NG	3.33 4	4.94 12	3.35 5	3.88 8	0.92 7	2.33 16	2.85 10	3.44 17	4.81 6	1.60 6	2.16 13	3.04 15	0.94 8	3.05
ICSH 90006 NG	1.60 16	5.30 11	2.98 9	4.42 3	0.77 9	3.27 4	2.71 14	5.55 7	4.07 17	1.24 14	2.20 12	2.42 10	0.55 15	3.04
ICSH 89013 NG	2.04 13	5.32 10	2.82 11	3.75 10	0.69 11	2.21 18	2.95 8	5.65 4	3.02 20	1.43 10	2.32 10	3.45 9	0.88 10	2.97
ICSH 89005 NG	3.11 5	4.45 14	1.76 16	3.23 14	0.44 14	2.69 11	2.98 7	4.09 12	4.20 16	1.09 17	1.80 18	3.58 8	0.12 19	2.79
ICSH 90001 NG	1.96 14	4.11 15	2.82 11	3.50 12	0.65 13	3.10 6	1.98 17	3.91 13	3.59 18	1.73 5	2.04 16	3.15 20	1.69 1	2.71
INRAN SOR-	1.87 15	4.63 13	2.08 14	3.08 15	0.71 10	2.72 10	1.90 18	3.41 18	4.21 15	1.11 16	2.48 8	3.38 12	1.28 4	2.63
HYB-1	2.22 12	3.91 17	1.92 15	2.79 16	0.40 15	1.73 19	2.65 15	3.83 14	3.53 19	1.89 2	2.26 11	3.18 14	0.90 9	2.61
INRAN SOR-														
HYB-2														
Controls	2.71 8	3.86 18	3.10 8	2.29 17	0.77 9	2.64 13	3.45 2	3.46 16	4.75 7	0.90 19	1.94 17	4.54 1	0.77 13	2.87
	0.00 17	4.03 16	3.84 2	1.88 18	1.10 3	1.42 20	2.16 16	3.62 15	4.64 10	0.74 20	1.31 19	2.85 18	0.82 12	(2.30)
ICSV 111														
Local	±0.407	±0.324	±0.459	±0.316	±0.140	±0.422	±0.214	±0.510	±0.667	±0.272	±0.241	±0.454	±0.211	
	2.66	5.22	3.00	3.66	0.87	2.71	2.88	4.70	4.50	1.42	2.31	3.46	0.88	
SE	27	11	27	15	28	27	13	19	26	33	18	23	42	
Mean														
CV (%)														

1. Randomized Block Design Experiment, 3 replications, plot size between 6 to 12m², rainy season 1991. Numbers following grain yields in a column indicate their rank at the site, local check varied at different sites.

Table 8. Mean plant height (cm) of test hybrids in the West African Adaptation Trial (WASIIAT) - 1991 conducted at 13 locations West African¹.

Entry	Nigeria	Nigeria	Senegal	Côte d'Ivoire		Mali	Mali	B. Faso	Cameroon	Ghana	Benin	Niger	Niger	Mean
	Zaria	Bagauda	Bambey	Bouaké	Ferké	Samanko	Cinzana	FarakoBâ	Maroua	Nyankapala	N'Dali	Tilebery	Maradi	
ICSH 89001 NG	135	224	195	215	207	203	232	218	208	200	184	213	183	203
ICSH 89002 NG	148	220	195	235	201	198	236	220	203	194	168	212	150	198
ICSH 90004 NG	143	219	197	222	192	203	220	212	205	186	181	194	158	197
ICSH 90005 NG	137	210	195	228	204	202	233	188	202	178	180	208	173	195
INRAN SOR-HYB-2	147	207	187	225	222	182	218	207	188	205	182	197	167	195
ICSH 89013 NG	133	213	193	225	201	192	233	212	188	190	173	212	170	195
ICSH 90006 NG	138	212	202	227	205	198	213	203	192	151	177	202	162	191
ICSH 507	135	204	185	208	184	182	217	200	200	172	168	189	165	186
ICSH 780	152	218	170	208	178	178	217	195	195	191	169	188	163	186
ICSH 89004 NG	147	202	180	210	180	178	212	200	193	185	160	199	142	184
ICSH 90003 NG	135	205	185	198	195	185	216	187	187	173	161	194	158	183
ICSH 89009 NG	137	210	172	217	186	190	214	207	177	157	164	193	137	182
ICSH 89005 NG	128	192	182	213	194	178	206	183	185	172	169	198	153	181
INRAN SOR-HYB-1	118	198	173	225	180	180	202	205	158	171	165	198	137	178
ICSH 90002 NG	128	197	173	192	181	178	204	187	183	162	153	190	143	175
ICSH 89007 NG	133	199	177	198	168	177	200	168	173	164	152	192	147	173
ICSH 89012 NG	128	197	175	195	167	178	191	172	167	165	148	188	127	169
ICSH 90001 NG	103	187	135	167	154	182	179	168	155	148	134	170	148	156
Controls														
ICSV 111	142	212	200	215	209	197	261	225	223	180	179	230	187	204
Local	-	199	168	222	202	377	375	262	220	219	182	282	218	(245)
SE	±6.7	±4.1	±6.3	±4.8	±4.2	±10.2	±4.7	±10.2	±6.8	±0.8	±5.1	±5.3	± 9.8	
Mean	135	206	182	212	191	197	224	206	190	178	168	203	160	
CV (%)	9	3	6	4	4	9	4	9	6	1	5	5	11	

1. Randomized Block Design Experiment, 3 replications, plot size between 6 to 12m², rainy season 1991. Local check varied at different sites

Table 9. Mean days to 50% flower of test hybrids in the West African Adaptation Trial (WASHAT) - 1991 conducted at 13 locations in West African¹.

Entry	Nigeria		Senegal	Côte d'Ivoire		Mali	Mali	B. Faso	Cameroon	Ghana	Benin	Niger		Mean
	Zaria	Bagauda	Bambey	Bouaké	Ferké	Samanko	Cinzana	Farakobâ	Maroua	Nyankapala	N'Dali	Tilebery	Maradi	
ICSH 89005 NG	68			65	73	72	63	71	66	86	73	75	76	73
ICSH 90006 NG	68	74	81	62	72	68	62	70	63	81	70	70	73	70
ICSH 90004 NG	68	72	75	64	70	79	60	68	63	85	66	71	70	70
INRAN SOR-HYB-2	69	71		63	72	70	61	68	62	76	67	69	70	69
ICSH 90005 NG	67	70	76	63	68	68	59	68	63	80	69	71	71	69
ICSH 89013 NG	69	69	75	64	71	71	58	69	63	80	68	71	71	69
ICSH 89002 NG	66	70	76	64	70	69	59	68	63	78	70	70	77	69
INRAN SOR-HYB-1	69	69	77	62	72	70	57	69	64	81	68	68	68	68
ICSH 99002 NG	67	70	78	63	66	72	58	67	60	76	68	70	70	68
ICSH 89012 NG	64	68	76	59	63	70	58	64	60	76	65	71	71	67
ICSH 89009 NG	65	68	77	60	69	68	57	66	62	78	65	68	74	67
ICSH 89004 NG	65	68	74	9	64	67	53	65	59	74	67	68	70	66
ICSH 89007 NG	64	67	75	59	66	70	57	64	60	74	66	69	71	66
ICSH 90003 NG	63	68	76	61	67	67	56	66	59	81	66	68	69	66
ICSH 507	63	68	72	60	66	69	53	61	59	78	62	68	69	65
ICSH 89001 NG	64	66	73	59	63	66	55	64	59	81	64	68	66	65
ICSH 780	62	65	75	60	63	63	53	63	56	81	65	64	65	64
ICSH 90001 NG	68	65	70	59	63	63	53	65	57	76	65	62	65	64
Controls														
ICSV 111	58			57	61	63	54		59		63			64
Local	-	63	74	53	60	78	59	63	60	73	70	69	72	
SE	±1.3	69	62	±1.0	±0.8	±1.4	±0.9	71	±1.2	62	±1.1	84	56	(65)
Mean	66	±0.7	±1.6	61	67	69	57		61	±1.1	69	±0.7	±1.3	
CV (%)	3	68	74	3	2	4	3	±1.1	3	78	3	70	70	
		2	4					66		3		2	2	

1. Randomized Block Design Experiment, 3 replications, plot size between 6 to 12m², rainy season 1991. Local check varied at different sites

NUMBER OF TRIALS AND RESULTS OBTAINED

WEST AND CENTRAL AFRICAN SORGHUM RESEARCH NETWORK (WCASRN)

Regional Trials and Nurseries

1991

Country	Trials and number of sets				
	WASVAT		<i>Striga</i>	Diseases	WASHAT
	Early	Medium			
Benin	0	1 R	0	0	1 R
Burkina Faso	2 R	2 R	0	1 R	1 R
Cameroon	1 R	1 R	1 R	1	2 R
CAR	0	1	0	0	0
Côte d'Ivoire	0	1	0	0	2 R
Gambia	1	0	1	0	0
Ghana	1 R	2 R	0	1 R	1 R
Guinea	0	1 R	0	1	0
Guinea Bissau	0	1	0	1	0
Mali	2 R	2 R	1 R	2 R	2 R
Mauritania	1 R	0	0	0	0
Niger	1 R	1 R	1	1	2 R
Nigeria	2 R	2 R	0	0	2 R
Senegal	1 R	1 R	1 R	0	1 R
Sierra Leone	1 R	1 R	0	1 R	0
Tchad	1	1	1	0	0
Togo	1	0	1	0	0
TOTAL DISPATCHED	15	18	7	9	14
TOTAL RESULTS RECEIVED	11	13	3	4	13

WASVAT = West African Sorghum Variety Adaptation Trial. Early and medium refer to maturity cycle.
WASHAT = West African Sorghum Hybrid Adaptation Trial. Disease nursery started in 1987 and *Striga* trial started in 1988. R = Results received.

WEST AFRICAN SORGHUM VARIETY ADAPTATION TRIAL - EARLY

WASVAT - Early

1991

Entry No	Genotype	Originating Program
1	NR 71176	Nigeria
2	NR 71169	Nigeria
3	CE 145-66 TRANS 2	Senegal
4	CE 314-18	Senegal
5	CE 315-14-1-1	Senegal
6	SSV-2	Senegal
7	CSM 219	Mali
8	Mota Maradi	Niger
9	90 W 194	ICRISAT
10	90 W 186	ICRISAT
11	90 W 197	ICRISAT
12	ICSV 401	ICRISAT
13	IN/Control	Ghana
14	Nagawhite/Control	
	Local control	

WEST AFRICAN SORGHUM VARIETY ADAPTATION TRIAL - MEDIUM

WASVAT-Medium

1991

Entry No	Genotype	Originating Program
1	S 219	Côte d'Ivoire
2	83-3/3-1-1	Burkina Faso
3	83-3/48-2-1	Burkina Faso
4	Kadaga	Ghana
5	CSM 388	Mali
6	NR 71158	Nigeria
7	NR 71149	Nigeria
8	Blanc de Bagou	Benin
9	90 W 187	ICRISAT
10	90 W 188	ICRISAT
11	90 W 190	ICRISAT
12	90 W 191	ICRISAT
13	90 W 193	ICRISAT
14	90 W 195	ICRISAT
15	90 W 196	ICRISAT
16	CS 85/Control	Cameroon
17	Local control	

WEST AFRICAN SORGHUM HYBRID ADAPTATION TRIAL

WASHAT

1991

Entry No	Hybrid	Originating Pedigree
1	ICSH 90001 NG	ICSA 2 X ICSV 361
2	ICSH 780	ICSA 11 X MR 908
3	ICSH 89001 NG	ICSA 11 X ICSV 247
4	ICSH 89005 NG	ICSA 37 X MR 904
5	ICSH 90002 NG	ICSA 37 X MR 861
6	ICSH 90003 NG	ICSA 37 X MR 912-2
7	ICSH 90004 NG	ICSA 37 C M 24525
8	ICSH 507	ICSA 38 X MR 926
9	ICSH 89002 NG	ICSA 38 X ICSV 247
10	ICSH 89007 NG	ICSA 38 X MR 917
11	ICSH 9005 NG	ICSA 38 X M 24525
12	ICSH 89009 NG	ICSA 39 X MR 906
13	ICSH 89012 NG	ICSA 39 X MR 917
14	ICSH 89013 NG	ICSA 39 X MR 941
15	ICSH 90006 NG	ICSA 39 X M 24791
16	ICSH 89004 NG	ICSA 41 X MR 841
17	INRAN SORGHUM HYBRID-1	Tx 623A X MR 732
18	INRAN SORGHUM HYBRID-2	Tx 613A X Suc 36
19	ICSV 111	Early Variety Control
20	Local	Early Maturing Variety Hybrid Controls

WEST AFRICAN SORGHUM LEAF DISEASE NURSERY

WASLDN - 1991

Entry No.	Variety	Program of Origin
1	4887	ICRISAT
2	BF 82-7/18-2-1	Burkina Faso
3	ICSV 94-3 BF	ICRISAT
4	BF 83-3/3-2-2	Burkina Faso
5	58581	ICRISAT
6	BF 83-3/32-1-1	Burkina Faso
7	E 35-1	-
8	BF 83-3/48-2-1	Burkina Faso
9	BF 83-3/3-1-1	Burkina Faso
10	BF 83-3/52-1-1	Burkina Faso
11	ICSV 2 (SPV 386)	ICRISAT
12	84 W 849	ICRISAT
13	84 W 966	ICRISAT
14	F2-20	Senegal
15	84 S 82	ICRISAT (Resistant)
16	IS 18442	ICRISAT germplasm (susceptible to anthracnose)
17	IS 13922	ICRISAT germplasm (susceptible to gray leaf spot)
18	ICSV 745	ICRISAT (susceptible to sooty stripe)

Numbers 15-18 are controls.

WEST AND CENTRAL AFRICAN SORGHUM *STRIGA* TRIAL

WCASST - 1991

Entry No.	Genotype
1	CS 54
2	IS 15823
3	CS-61 X Framida
4	82 S 51 X CS 61
5	IS 1260
6	S-35 X S-34
7	CS 54 X CS 63
8	CS 95
9	CS 54 X Djigari
10	CS 35
11	CS 210
12	CS 141
13	Local control

All entries were submitted by the WCASRN's *Striga* project in Cameroon as per recommendation of the Steering Committee

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1992-06

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