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West and Central Africa Sorghum Research Network
(WCASRN)

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June 1989 - May 1990

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International Crops Research Institute for the
Semi-Arid Tropics

(ICRISAT)

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INTRODUCTION

Program Description and Objectives

The West and Central Africa Sorghum Research Network (WCASRN) comprises of 17 member countries : Benin, Burkina Faso, Cameroon Central African Republic, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Tchad, and Togo. Through the USAID/SAFGRAD/ICRISAT Grant No.698-0452-G-00-6023 the WCASRN addresses itself to the sorghum improvement problems of West Africa on a regional basis, concentrating on production constraints of significance to the 17 member countries. In addition to solving sorghum production problems, phase 2 of the WCASRN, which began in 1986, stresses training as an important and integral part of its activities. Most of the 17 countries in the Network have weak research programs in sorghum. Thus, the overall theme in the set of Network objectives is to strengthen the sorghum research capabilities of the national agricultural research systems (NARS).

The objectives of the WCASRN are :

- to increase the production of sorghum thereby contributing to the stabilization of food supplies in the region and contributing to improved nutrition and income for farmers in the drier areas of the region;
- to assist and strengthen national sorghum improvement programs, and contribute to their research needs in all agroecological semi-arid zones;
- to develop improved varieties and hybrids and agronomic/management practices capable of giving higher and more stable economic yields in the semi-arid environments;
- to facilitate the development of agricultural research manpower among West African nationals at all levels;
- to organize regional workshops and monitor uniform yields through field inspections.

Scope of the Report

This report consists of two sections covering activities of the Network between June 1989 and May 1990. The first section covers the following activities for the period under review: training, regional trials and nurseries, collaborative research projects, monitoring tour, steering committee meetings, and visits to NARS. Details on some of these activities are given in the annexes. The second section briefly summarizes the major difficulties encountered and some of the more important activities planned for 1990/91.

SECTION ONE

TRAINING

Training Workshop on Agronomic Research and On-Farm Testing

This workshop was held in Bamako, Mali between 9 and 29 September, 1989. Nine out of ten countries invited were represented. The representative from Central African Republic was absent. The countries invited were Central African Republic, Côte d'Ivoire, Gambia, Ghana, Guinea Bissau, Mauritania, Niger, Nigeria, Senegal, and Sierra Leone. There was a total of 11 lectures and five field visits. Lecture topics ranged from soil fertility, control approaches to *Striga*, and crop and animal interaction to principles of on-farm testing. Field visits included a trip to the Cinzana research station some 270 km from Bamako, the national program at the Sotuba station just outside Bamako, a special *Striga* field trip to Katibougou, about 70 km north of Bamako, and trials of ICRISAT's West African Sorghum Improvement Program (WASIP) at the new site at Samanko, 18 km from Bamako. A detailed report on this training workshop is given in Annex 1.

REGIONAL TRIALS AND NURSERIES

Two variety trials were organized for 1989. These were the West African Sorghum Variety Adaptation Trial - Early and Medium duration (WASVAT-Early and Medium).

In addition, there was one hybrid trial, the West African Sorghum Hybrid Adaptation Trial (WASHAT), and the West African Sorghum *Striga* Trial (WASST). The West African Sorghum Leaf Disease Nursery (WASLDN) was also organized.

1989

WASVAT-Early duration consisted of 20 entries. The entries included varieties from the national programs of Mauritania, Cameroon, Senegal, Ghana and from WASIP. Sixteen sets of this trial were sent to 12 countries. Results with relatively low coefficient of variation were received from 10 locations in seven countries and are given in Table 1. The variety ICSV 1079 BF had the highest mean yield (2.74 t ha^{-1}) of all 10 locations (Table 1). The overall mean days to 50% flowering ranged from 60 to 72 days. WASVAT-Medium duration also had 20 entries and included varieties from the national programs of Cameroon, Niger, Ghana, Burkina Faso, Senegal, Benin, Mauritania and from WASIP. Nineteen sets were sent to 16 countries and results with low coefficient of variation were obtained from nine sites in seven countries. The variety ICSV 1171 BF had the highest mean yield of 2.37 t ha^{-1} of all nine locations

(Table 2). The overall mean days to 50% flowering was between 72 and 91 days.

WASHAT was grown at nine locations in six countries and consisted of 20 entries from Niger and ICRISAT. Results were received from eight locations in six countries. ICSH 507 exhibited the highest mean yield of 3.66 t ha⁻¹ of all eight locations (Table 3). Mean time to 50% flowering was between 64 and 73 days.

Although 10 sets of WASLDN were sent to nine countries, results were obtained from only two countries. The 25 entries in this nursery were scored for gray leaf spot and leaf anthracnose at both locations. Twenty-two of the 25 entries and all 25 entries had mean scores of 3.0 or less on a 1-6 scale, for leaf anthracnose and gray leaf spot, respectively, at both locations. The more resistant lines for both diseases included 84 S 82, 84 S 130, 84 S 103-2, and IS 3443.

The *Striga* trial was sent to nine countries and results were received from six countries. Because of several zeros and the absence of *Striga* counts in the first repetition, the results from Nigeria were not included in the analysis of the data. Promising lines for *Striga* included ICSV 1007 BF, IS 9830, ICSV 1001 BF, ICSV 1164 BF, and ICSV 1115 BF. Time to 50 % flowering was between 49 and 90 days.

1990

The trials for 1990, the countries they were sent to, and the number of sets sent to each country are given in Table 4.

At the fifth Steering Committee meeting of WCASRN in May 1989, it was recommended that national programs should be asked to closely evaluate certain varieties that have shown some promise over the years. A technical information sheet for this purpose was prepared (Annex 2). These varieties are ICSV 1063 BF, CE 180-33, ICSV 111 IN, ICSV 1083 BF and Malisor 84-1.

COLLABORATIVE RESEARCH PROJECTS WITH NATIONAL AGRICULTURAL RESEARCH SYSTEMS

The West and Central Africa Sorghum Research Network initiated four research projects in four NARS in June 1989. These projects are leaf anthracnose (*Colletotrichum graminicola*) in Burkina Faso, long smut (*Tolyposporium ehrenbergii*) in Niger, head bug (*Eurystylus* sp.) in Mali and technology of wheat-sorghum composite flour in Nigeria.

The main objectives of the anthracnose project are to determine whether pathotypes of the pathogen occur in Burkina Faso

and to identify genotypes resistant to the pathotypes. The objective of the long smut project in Niger is to develop a simple and effective inoculation method for use in screening techniques. The project on head bug in Mali emphasizes among other things, the biology of the insect, its economic importance, and identification of resistant sources. In Nigeria, the project scientists hope to develop a technology for producing acceptable wheat-sorghum composite flour for bread and confectionery, aimed at increasing the sorghum component as high as possible.

A project on identification of *Striga* resistant lines will start in 1990 by the Cameroon national program. Each of these projects will receive \$ 5,000 per year for two years.

Progress of the Projects

A working group meeting on the research projects on leaf anthracnose (Burkina Faso), long smut (Niger), and head bugs (Mali) was held in Bamako between April 19 and 20. Results of the first years' work were presented and future plans were discussed. The principal investigators, evaluators from the national programs of Burkina Faso, Niger, and Mali, and resource persons from ICRISAT's Regional Program and FAO in Mali participated.

Using the spreader row technique, the project in Burkina Faso screened a total of 80 sorghum lines, of which 56 were local varieties and 24 were introduced genotypes. Seventy-four out of the 80 lignes tested were resistant (mean score of 3 or less in a 1-6 scale) to the foliar stage of the disease. Of the six susceptible lines, four were introduced genotypes. Only one introduced genotype was susceptible to stem infection.

Grains of thirty out of the 80 lines were free of the fungus. The level of grain contamination by *C. graminicola* was higher in introduced genotypes. In addition to confirming these first year results, work on the variability of the pathogen will be undertaken during the second year.

Results from the project on head bugs in Mali indicated that the population of *Eurystylus marginatus* was more abundant towards the end of September and October. Early planting resulted in no attack by *E. marginatus*, whereas two generations of the insect developed in late planted sorghums. In a screening experiment 25 out of 100 lignes were an advance trial and in an international nursery. A limited survey in farmer's fields revealed that in certain localities, *E. marginatus* attack was higher in introduced lines than in locals. However, the level of attack depended on the locality and some local varieties were severely attacked in some localities. Work will continue on these aspects of the project during the second year.

The project on long smut in Niger encountered problems with flooding in the field due to high rainfall. In addition, attempts on artificial inoculation were unsuccessful.

A working group meeting on the project in Nigeria is planned for September 13 or 14 at the Institute of Agricultural Research in Zaria. Preliminary data from this work indicate that there were no significant differences in the Specific Leaf Volume (SLV) up to 50% level of substitution of wheat with sorghum and that bread produced up to that level of substitution was acceptable. However, the higher the level of substitution, the lower was its overall quality. Furthermore, the control (100% locally grown wheat) with a SLV of 3.31 cm/g gave the best loaf.

New forms for project description, project progress reports, financial reports, and project evaluation are now available (Annex 3). It should be mentioned that the financial reports received from Burkina Faso and Mali during the working group meeting were quite satisfactory.

MONITORING TOUR

A monitoring tour was organized between 9-18 October, 1989 in which representatives of Benin, Burkina Faso, Cameroon, Guinea, Mali, Chad and Togo visited Mali, Burkina Faso and Niger. They visited national, regional and international trials and nurseries at Sotuba, Samanko and Cinzana in Mali, Farako-Ba and Saria in Burkina Faso, and Lossa, Tillabery and Maradi in Niger. A more detailed report on this tour is given in Annex 4.

STEERING COMMITTEE MEETINGS

The sixth Steering Committee meeting was held in Ouagadougou, Burkina Faso, between November 14-17, 1989. The Committee spent most of its time discussing the development of the long-term strategic plan for phase III of the Network. The strategic plan will consider the following:

- improvement of NARS research bases;
- the extent to which lead NARS were developed to be able to discharge regional research responsibilities to generate and evaluate technologies;
- the extent of training support provided by respective NARS governments and donors to implement proposed long-term plans for human resource development;
- more resource commitments to agricultural development and research by government of respective NARS;

- the extent to which an environment conducive to a productive research career has evolved to motivate NARS scientists to increase research output for national development;
- administrative simplicity of the Network Coordination unit is provided;
- the extent and re-orientation of IARC's programs to provide technical back-stopping with sensitivity to shift network leadership and management to NARS.

Some of the other salient points raised at the meeting were:

- the Committee agreed that the Coordinator should hire translation services for Network activities as required;
- the Coordinator will use unexpended training fund (approximately \$ 1,000) and shift approximately \$ 7,000 from other Network budget items to finance the participation of 4 network personnel to the SAFGRAD Combined Networks Agronomy Training Workshop in late 1990;
- Funds budgeted for Monitoring Tours and Workshop in 1990 will be used to finance a Training Workshop on Post Harvest Technology, Seed Quality and Utilization on March 25 - April 5, 1991 in Kano, Nigeria;
- the next Regional workshop was scheduled for January 15-18, 1991 in Niamey. In order to encourage a higher caliber of technical publications, the Committee decided to call 2 types of papers; scientific papers of journal quality will be invited from selected individuals in the network, as well as from international authorities in sorghum;
- the Committee was informed of the availability of funds for research projects from the African Development Bank via the SAFGRAD Coordination Unit. Dr. Bezuneh will provide projects proposal forms to all member countries.

The seventh Steering Committee meeting was held between 2 and 4 May, 1990 in Niamey, Niger. Members and observers of the current Steering Committee are as follows:

Burkina Faso	S. Da	member
Cameroon	O.P. Dangi	member
Chad	D. Yagoua	member
Mali	M.D. Traoré	member (Chairman)
Niger	J.W. Clark	member
Nigeria	C.C. Nwasike	member

ICRISAT	M.D. Thomas	member (Coordinator)
SAFGRAD	T. Bezuneh	Regular observer
USAID	G. Kingma	Regular observer
Glaobal 2000	A representative	observer
INSAH/CILSS	A representative	observer
IRAT/CIRAD	A representative	observer.

The Steering Committee decided to invite INTSORMIL and the Team Leaders of ICRISAT's West African Sorghum Improvement Programs (WASIP) in Kano, Nigeria and in Bamako, Mali, as observers.

Major points dicussed at the seventh Steering Committee meeting included results of the 1989 regional trials, collaborative research projects, the budget, and some future activities of the Network. In keeping with the philosophy of the Network that stronger NARS should help weaker ones, the Committee agreed that during the 1990 crop season, S. Da would visit Togo and Benin, C.C. Nwasike would visit Ghana, and O.P. Dangi Chad and Central African Republic. Another important decision was that WCASRN would hold its fourth regional workshop jointly with the two other commodity Networks (Cowpea and Maize) on 25 to 30 March, 1991 in Niamey, Niger. Other decisions were:

1. that the collaborative project from Cameroon on *Striga* be accepted on the condition that the work involved, identitification of resistant lines with a view to develop a regional *Striga* nursery;
2. a joint agronomy workshop for all three commodity networks;
3. that WCASRN invites representatives from some NARS to attend, at the expense of the Networks, the sorghum utilization conference in Bamako, Mali in November 1990.

VISITS TO NATIONAL PROGRAMS

Since 1989, these visits have become more structured. Whereas the Coordinator concentrates on visiting the five lead NARS in order to effectively monitor the collaborative research projects in those countries, Steering Committee members from strong NARS visit the weaker NARS.

The Coordinator will also undertake pre-season visits to some of the weaker NARS during which he would carry seeds for that season's regional trials and discuss difficulties with respect to planting and management of the trials. To further structure and standardize these visits, guidelines and manpower information sheets have been prepared (Annex 5).

The following visits were made in 1989 and 1990:

1. Senegal and Gambia by M.D. Traoré in September, 1989
2. Burkina Faso by the Coordinator in October 1989
3. Guinea (Conakry) and Sierra Leone by the Coordinator in April, 1990.

The following visits are scheduled for 1990:

1. Benin and Togo - S. Da
2. Ghana - C.C. Nwasike
3. Chad and Central African Republic - O.P. Dangi
4. Niger, Nigeria, Burkina Faso and Guinea Bissau - the Coordinator.

SECTION TWO

DIFFICULTIES AND SHORTCOMINGS

Regional Trials

The quality of the results needs to be improved. The coefficient of variation from a number of locations have been too high for the results to be included in the statistical analyses. The notebooks containing the results are received too late and thus the preparation of the annual progress report is also delayed. More and more NARS are requesting funds for the conduct of these trials. It is not known how the absence of funds for these trials have affected the level of management of the trials. Another difficulty has been that the results from these trials have not been widely distributed to the NARS. Almost always the French versions of these results and of the annual progress report do not exist. The reason for this latter problem is given below under secretariat and translation services.

Secretarial and Translation Services

The office of the Coordinator has one bilingual secretary and a driver. For the most part, the secretary is occupied with typing of reports, letters and other documents and of the translation of such documents into French when necessary. However, longer reports such as the annual progress reports remain in English, yet 13 out of the 17 member countries are French speaking. It has proved difficult to find competent personnel who are familiar with technical and scientific words to be hired on an adhoc basis for this purpose.

Visit to NARS

The size of the Network, with 17 countries, creates a problem with respect to annual visits by the Coordinator. Even if half of these countries are visited per year, it takes a lot of time to travel and to effectively interact with officials and the NARS scientists during the limited period when the crop is going through its maturity cycle -heading to physiological maturity. Thus, visits to NARS by the Coordinator have not been as frequent as it should be.

Collaborative Research Projects

The project on *Striga* in Cameroon was started one year later than the other projects. There were logistic and technical difficulties with the project on long smut in Niger during the first year. Thus, no preliminary results are available.

Promising varieties

The promising lines from the regional trials since 1986 have not been intensely evaluated. Only recently efforts have been made in this respect. A systematic procedure by the the Network to get NARS to use these lines in their programs should have been developed. For example, separate multiplication and distribution of the seeds to breeding programs of the NARS.

FUTURE WORK PLANS

- Representatives from some NARS will be invited to participate as observers in the symposium on Sorghum Utilization in November 1990 in Bamako. This replaces the grain quality and utilization training program that was scheduled for March 1991 in Kano, Nigeria. The training program was cancelled because of a proposal from SAFGRAD Coordinating Office in Ouagadougou that a joint regional workshop of all the Network be held in March 1991.
- A joint Agronomy training workshop with the maize and cowpea Networks is planned for January 1991 at IITA, Ibadan, Nigeria.
- Since the next regional workshop will be held in March 1991, national programs have been invited to send to the Coordinator seeds of varieties they would like to go into the 1991 regional trials. This would give the Coordinator a chance to multiply the seeds during the off-season of 1990/91. The list of varieties multiplied will then be presented at the regional workshop for finalization.

- A project from Niger on grain quality is under consideration for financing.
- The next regional workshop is scheduled for March 25 to 30, 1991, in Niamey, Niger. It will be a joint workshop with the other USAID/SAFGRAD Networks in West Africa.
- A working group meeting on the project on sorghum-wheat composite flour for bread making is scheduled for September 13, 1990.
- Efforts are already underway to translate into french some important documents of the Network. For example, annual progress reports and some trip reports of the Coordinator.
- National programs will start intensive evaluation of some promising varieties in the regional trials.

Table 1. Mean grain yield ($t\ ha^{-1}$) of early duration varieties in the West African Sorghum Variety Adaptation Trial (WASVAT) from 10 locations grown in a randomized block design, three replications with plot size between 5.8 and 14.4 m^2 , rainy season, 1989.

Entry	L O C A T I O N S ¹																				Mean
	1	2	3	4	5	6	7	8	9	10											
ICSV 1079 BF	2.84	2	3.18	2	3.24	7	2.29	4	2.40	6	2.74	13	4.83	2	3.18	1	1.45	1	2.71	3	2.74
CS-61	2.99	4	1.94	18	3.54	2	2.40	1	1.96	11	3.24	8	4.98	1	2.96	3	1.25	4	2.57	8	2.65
ICSV 111 IN	2.38	9	2.70	7	3.16	9	1.99	10	1.60	16	3.33	7	4.73	3	2.72	6	1.37	2	2.89	1	2.55
ICSV 1172 BF	2.55	7	3.16	3	3.25	6	1.83	14	2.00	10	3.46	5	4.59	4	2.48	9	0.46	19	2.28	11	2.47
CS-54	2.73	6	2.68	8	3.28	5	1.91	13	2.02	9	2.69	14	3.96	10	2.84	4	1.12	5	2.79	2	2.45
ICSV 1177 BF	2.10	12	3.46	1	3.10	10	2.40	3	1.90	12	2.75	12	3.90	13	2.03	15	0.94	9	2.71	3	2.44
ICSV 1176 BF	3.03	3	2.75	6	2.60	16	2.03	8	2.67	4	3.42	6	3.84	14	2.51	8	0.80	11	2.11	13	2.40
ICSV 401 IN	3.17	2	2.44	13	2.61	15	2.16	6	2.48	5	2.61	15	4.29	6	2.97	2	0.96	8	1.90	15	2.38
ICSV 1125 BF	2.13	10	2.54	10	2.89	12	1.92	12	1.79	13	3.50	3	4.47	5	2.41	10	0.72	15	2.23	12	2.37
ICSV 242 IN	2.08	14	2.45	12	2.54	18	2.00	9	2.81	2	3.48	4	3.97	9	2.01	16	0.65	16	2.66	5	2.35
CE 157-382	2.52	8	1.95	17	3.22	8	2.42	2	1.76	14	2.38	17	3.91	12	2.52	7	1.01	6	2.54	9	2.31
ICSV 1170 BF	3.25	1	2.46	11	3.37	4	2.00	9	2.13	8	1.67	18	3.91	12	2.23	11	0.79	12	2.23	12	2.30
CE-196-17-2-1	2.09	13	2.16	16	2.94	11	2.22	5	1.71	15	3.22	9	4.20	7	2.11	14	1.28	3	-	-	2.24
ICSV 1174 BF	2.12	11	2.45	12	2.56	17	1.82	15	1.33	17	3.15	10	3.66	15	2.19	13	0.76	13	2.64	6	2.20
ICSV 258 IN	1.72	16	2.77	5	1.81	20	1.96	11	2.96	1	3.04	11	3.57	16	2.11	14	0.65	16	2.60	7	2.20
ICSV 1175 BF	1.20	18	2.55	9	2.66	14	2.12	7	1.96	11	2.50	16	3.35	17	2.20	12	0.61	17	2.08	14	2.00
Lekwere Bedha	1.28	17	1.89	19	2.84	13	1.49	18	0.69	19	0.75	19	2.26	18	0.35	18	0.53	18	1.19	16	1.32
Nabana Beida	1.13	19	2.43	14	2.18	19	1.75	16	1.15	18	0.64	20	1.81	19	0.39	17	0.61	17	-	-	1.27
Controls																					
Nagawhite	2.73	6	2.95	4	3.75	1	2.67	1	2.73	3	5.49	1	4.15	8	2.51	8	0.75	14	2.49	10	2.85
IRAT 204	2.01	15	2.28	15	3.38	3	1.72	17	2.17	7	4.53	2	3.93	11	2.75	5	0.83	10	2.67	4	2.59
SE	± 0.32	-	± 0.18	± 0.18	± 0.26	± 0.43	± 0.36	± 0.14	± 0.29	± 0.21											
Trial mean (20 entries)	2.30	2.55	2.95	2.06	1.96	2.93	3.92	2.27	0.88	2.40											
CV (%)	24	18	11	15	23	25	16	22	28	26											

1. Locations: 1 = Farako-Ba, 2 = Saria in Burkina Faso; 3 = Guiring in Cameroon; 4 = Cinzana, 5 = Samanko in Mali; 6 = Maradi in Niger; 7 = Bagauda in Nigeria; 8 = Nyankpala, 9 = Manga Bawku in Ghana; 10 = Bambey in Senegal.

Table 2. Mean grain yield ($t\ ha^{-1}$) of medium duration varieties in the West African Sorghum Variety Adaptation Trial (WASVAT-Medium) from 10 locations grown in a randomized block design, three replications with plot size between 6 and $14.4\ m^2$, rainy season, 1989.

Entry	L O C A T I O N S ¹																		Mean
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	
ICSV 1171 BF	3.71	1	2.74	2	1.84	1	1.20	4	2.71	3	4.03	3	2.68	8	4.83	1	0.18	11	2.37
F2-20	2.91	9	2.78	1	1.32	8	1.32	2	2.73	2	3.50	6	2.41	11	4.45	5	0.32	3	2.34
CS-95	2.45	13	2.66	3	1.63	3	1.30	3	2.50	7	4.35	1	2.58	9	4.78	2	0.42	1	2.32
ICSV 1089 BF	2.94	8	1.97	12	1.51	5	1.00	8	2.42	9	3.48	7	2.81	7	4.03	10	0.07	15	2.29
SEPON-82	3.32	2	2.35	6	1.67	2	1.15	5	2.65	5	4.31	2	2.93	4	4.44	6	0.18	11	2.25
ICSV 1163 BF	3.03	6	2.42	5	1.54	4	1.32	2	2.23	12	3.73	4	2.83	6	4.74	3	0.24	6	2.17
BF-82-4/4-1-1	2.98	7	2.29	8	1.39	7	1.20	4	2.83	1	2.38	12	2.41	11	4.14	9	0.22	7	2.14
ICSV 1063 BF	2.65	11	2.19	10	1.40	6	1.13	6	2.58	6	3.38	8	3.38	2	3.83	11	0.21	8	2.11
ICSV 1157 BF	2.64	12	2.32	7	0.68	14	1.12	7	2.17	13	3.63	5	2.50	10	4.32	7	0.26	5	2.06
CS-85	3.09	4	1.83	13	1.32	8	0.52	15	2.38	10	3.21	9	3.48	1	4.54	4	0.14	12	2.04
IS 6928	3.06	5	2.16	11	0.83	11	0.71	12	2.46	8	2.46	10	2.85	5	3.37	13	0.30	4	1.97
BF-80-16/6-2-3	2.06	16	2.28	9	1.17	10	0.87	10	2.17	13	3.50	6	2.29	13	4.32	7	0.39	2	1.88
BF-82-3/25-1-1	3.03	6	1.38	16	0.70	13	0.77	11	2.67	4	2.38	12	2.98	3	3.42	12	0.09	14	1.80
IS 22380	2.67	10	2.42	5	0.73	12	0.96	9	2.29	11	2.42	11	2.36	12	3.14	14	0.07	15	1.78
IS 23526	3.12	3	1.61	14	0.48	15	0.54	14	1.71	14	2.15	13	2.18	14	2.49	15	0.12	13	1.57
Niobougou	1.69	18	1.53	15	0.32	16	0.62	13	0.46	17	1.77	15	1.45	16	1.21	16	0.12	13	1.00
NSV-1	1.87	17	1.32	18	-	-	0.28	17	1.46	15	1.56	16	1.11	18	-	-	0.19	10	1.00
Blanc de Karimana	2.34	15	0.33	19	-	-	0.05	18	0.50	18	0.29	18	1.25	17	-	-	0.06	16	0.83
Takmalit	1.41	19	1.36	17	0.13	17	0.43	16	0.35	19	0.92	17	1.66	15	-	-	0.20	9	0.75
Controls																			
Local	2.35	14	2.65	4	1.31	9	1.39	1	1.44	16	1.79	14	0.26	19	4.16	8	0.24	6	1.85
SE	± 0.31		± 0.26		± 0.19		± 0.15		± 0.22		± 0.32		± 0.37		± 0.17		-		
Trial mean (20 entries)	2.67		2.00		1.11		0.89		2.04		2.76		2.32		3.89		0.20		
CV (%)	20		22		30		30		18		20		28		13		25		

1. Locations: 1 = Farako-Ba, 2 = Saria in Burkina Faso; 3 = Manga Bawku in Ghana; 4 = Sotuba, 5 = Samanko in Mali; 6 = Bengou in Niger; 7 = Bagauda in Nigeria; 8 = Niore in Senegal; 9 = Tantieou in Togo.

Table 8. Proposed budget for WCASRN Coordinating Office
1992-1996 in US dollars (x 1000)

Item	1992	1993	1994	1995	1996	TOTAL
1. Coordinator salaires/allowances	100	105	110	115	120	450
2. Support staff* salaires/allowances	30	31.5	33	34.6	36	165.1
3. Labor	15	18	21.6	26	31.2	111.8
4. Travel	25	30	36	43.2	51.8	186
5. Supplies	25	30	36	43.2	51.8	
6. Communications	15	18	21.6	26	31.2	111.8
7. Commodities & requirements	20	24	28.8	34.6	41.5	148.9
8. Vehicle	18	21.6	26	31.2	37.4	134.2
9. Petrol & Lubricants	3.5	4.2	5.0	6.0	7.2	25.9
10. Vehicle maintenance	3	3.6	4.3	5.2	6.2	22.3
11. Workshops	-	77.7	-	93.3	-	171
12. Monitoring Tours	50	-	60	-	72	182
13. Training workshops		30	-	36	-	66
14. Steering Committee Meetings	25	30	36	43.2	51.8	186
15. Consultants	15	18	21.6	26	31.2	111.8
Total	344.5	441.6	439.9	563.5	569.3	2358.8

*One secretary, one field assistant, one computer technician, one driver.

1990
25
166

Table 9. SORGHUM NETWORK RESEARCH PERSONNEL (1989/90)
IN WEST AND CENTRAL AFRICA*

Country	Breeder			Agronomist			Entomologist			Pathologist			
	MSC	BSC	PhD	MSC	BSC	PhD	MSC	BSC	PhD	MSC	BSC	PhD	
Benin						1		1	BSC				
Burkina			1			1 (+1)			1			1BSC	
Cameroon	1MSC	(+1)		1MSC	(+)	-		1BSC	(+1)			(+1)	
Cape Verde	-		-	1MSC									
Mauritania												1BSC	
Cent.Af.Rep.	NA		NA	NA		NA		NA		NA		NA	
Cote d'Ivoire				1MSC									
Ghana		3	BSC									1 (part-time)	
G. Conakry	-		-			2BSC		(1)					
G. Bissau						2BSC							
Gambia		1BSC		-		1MSC		1BSC					
Mali		7MSC				3BSC	(+)	4MSC	1		1	1	1MSC
Nigeria		1MSC		1		3MSC		2			1	1MSC	1
Niger		1MSC	(+1)			2MSC			1MSC	(+1)	1(+1)	2MSC	
Senegal													
Sierra Leone		1MSC											
Tchad		1MSC				(+1)		1BSC					
Togo				1BSC								1BSC	

*The number of researchers indicated for each country do not include expatriate staff.

Figure in parenthesis indicate researchers in training abroad

NA - information not available
Source : WCASRN reports

Table 3. Mean grain yield (t ha⁻¹) of test hybrids in the West African Sorghum Hybrid Adaptation Trial (WASHAT) at 8 locations in West Africa, rainy season 1989.

Cultivar	Bagauda	Guiring	Tarna	Sotuba	Samanko	Bouaké	Farako-Ba	Lossa	Mean
ICSH 230	4.84	7.04	3.60	3.56	2.7	1.62	4	1.81	3.32
ICSH 232	5.05	7.18	3.34	3.33	2.80	1.15	6	1.39	3.20
ICSH 642	4.89	7.16	3.82	2.81	2.91	1.47	6	1.88	3.29
ICSH 780	5.43	7.54	3.48	3.32	3.40	1.43	5	2.74	3.60
ICSH 89001 NG	4.89	7.06	4.27	2.33	2.98	2.09	1	2.29	3.46
ICSH 479	5.23	7.21	3.61	3.54	2.89	1.02	4	1.81	3.36
ICSH 88038	3.57	6.58	4.47	3.35	2.56	1.44	0.90	1.86	3.09
ICSH 88039	4.57	6.49	4.40	2.93	2.67	1.18	0.84	2.05	3.14
ICSH 507	5.48	7.64	4.84	3.40	2.93	2.08	2	1.70	3.66
ICSH 89002	4.92	7.98	4.41	3.41	3.51	1.51	5	1.14	3.57
ICSH 330	4.19	7.36	3.70	3.19	3.60	1.40	1	1.67	3.25
ICSH 646	0.97	3.77	1.24	1.82	0.93	0.10	0.18	0.38	1.17
ICSH 88042	4.85	7.20	3.45	2.51	3.53	1.01	1.07	1.81	3.18
ICSH 89003 NG	4.67	6.91	4.11	3.53	3.49	1.21	0.87	1.60	3.30
ICSH 89004 NG	4.40	5.82	4.71	3.60	3.20	1.36	0.96	1.60	3.21
Tx 623A x MR 732	4.33	6.95	5.33	3.71	3.07	1.34	1.03	2.92	3.58
(INRAN Sorghum Hybrid)									3
Tx 631A x SUCR36	5.34	6.92	4.01	2.74	2.98	1.10	0.64	1.63	3.17
(INRAN Sorghum Hybrid)									
Controls									
ICSH 109	4.21	6.00	4.55	2.69	3.09	1.06	0.49	1.81	2.99
ICSH 111	3.34	6.07	3.55	2.44	3.00	1.95	3	1.63	2.98
Local	4.69	6.65	3.62	3.07	1.44	1.08	0.93	1.08	2.82
SE	± 0.815	± 0.537	± 0.370	± 0.550	± 0.308	± 0.396	± 0.410	± 0.530	
Trial mean	4.49	6.80	3.93	3.06	2.88	1.33	1.09	1.77	3.17
CV (%)	18	8	16	18	11	30	37	30	

1. The local control variety was different at various locations.

Table 4. West and Central African Sorghum Research Network's 1990 regional trials and nurseries.

Country	Trials and number of sets				
	WASVAT				WASHAT
	Early	Medium	<i>Striga</i>	Diseases	
Benin	0	1	1	0	1
Burkina Faso	2	2	0	1	2
Cameroon	1	1	1	1	2
Central Afr. Rep.	0	1	0	0	0
Cote d'Ivoire	0	1	0	0	2
Gambia	1	1	0	0	0
Ghana	1	2	1	1	2
Guinea	0	1	0	1	0
Guinea Bissau	0	1	1	1	0
Mali	1	1	1	1	3
Mauritania	1	0	0	0	0
Niger	1	1	1	1	3
Nigeria	2	2	4	0	1
Senega	1	1	0	0	0
Sierra Leone	1	1	0	0	0
Tchad	1	1	0	0	0
Togo	1	0	1	0	0
Total	14	18	11	7	16

ANNEX 1. REPORT ON TRAINING WORKSHOP ON
AGRONOMY AND ON-FARM TESTING

SAFGRAD/USAID/ICRISAT

WEST AND CENTRAL AFRICA SORGHUM RESEARCH NETWORK
(WCASRN)

Report on the Training Workshop on
Agronomic Research and On-Farm Testing

September 19 - 30, 1989
Bamako, MALI

INTRODUCTION

At the regional workshop of the West and Central Africa Sorghum Research Network (WCASRN) held at Maroua, Cameroon, in September 1988, it was decided that a training workshop on Agronomic Research and On-farm Testing should be organized in 1989. The fifth Steering Committee meeting of WCASRN, held in Bamako from 9 to 11 May, 1989, recommended that the workshop should start on the second week of September, 1989. The objectives of the workshop were :

- to provide sorghum researchers in National Agricultural Research Systems (NARS) with basic information on agronomic research;
- to familiarize the participants with fundamental approaches and skills in agronomic research;
- to stress the usefulness of on-farm testing and its relationship to agronomic research;
- to provide a forum for the exchange of ideas and the sharing of common and unique experiences on agronomic problems.

The Workshop was primarily targeted towards researchers who at least were either within higher categories of technicians with some years of experience or first degree holders.

The Workshop was held in the conference room at ICRISAT's West Africa Sorghum Improvement Program (WASIP) office in Bamako between September 9 and 29, 1989. There was a brief opening ceremony attended by some staff members from WASIP and from the national program of Mali. The Team Leader of WASIP, Dr. K.V. Ramaiah, welcomed the participants and guests. The opening address was given by Dr. O. Tall, Director General of IER (Institut d'Economie Rurale). Dr. John S. Caldwell from the Farming Systems Research Division of IER gave the introductory lecture on Sustainable Agricultural Systems. The excellent logistic support from WASIP's administration and the deep interest shown by IER during the workshop are highly appreciated.

THE PARTICIPANTS

Nine out of ten countries invited were represented. The representative from Central African republic was absent. The countries invited (listed in alphabetic order), and the names of the participants and their respective disciplines are given below.

<u>COUNTRY</u>	<u>NAME OF PARTICIPANTS</u>	<u>DISCIPLINE</u>
1. CAR	Absent	-
2. Cote d'Ivoire	Kouassi KOUADIO	Breeder
3. Gambia	Mustapha JALLOW	Entomologist
4. Ghana	Eric K. ATSU	Breeder
5. Guinea Bissau	Domingos FONSECA	Breeder
6. Mauritania	Abdoulaye SOW	Agronomist
7. Niger	Cherif Ari OUMAROU	Breeder
8. Nigeria	K.A. ELEMO	Agronomist
9. Senegal	Mamadou LO	Agronomist
10. Sierra Leone	Malcolom Sellu JUSU	Breeder.

LECTURERS

The Workshop benefited from highly qualified lecturers from different institutions who have had wide experience in their respective fields. It was heartening that lecturers included experts from the national program of Mali. The list of lecturers in alphabetical order and their institutions are given below. The areas on which they lectured are indicated on the workshop program at the end of this report.

<u>LECTURER</u>	<u>INSTITUTION</u>
1. P. Bartholomew	ILCA, Bamako
2. J.S. Caldwell	IER
3. I. Dembele	IER
4. A. Diarra	IER
5. M. Goita	IER
6. G. Hoffmann	WASIP, Mali
7. A. Konate	IER
8. M. N'Diaye	IER
9. K.V. Ramaiah	WASIP, Mali
10. C. Reddy	INRAN (National Program, Niger)
11. C. Renard	ISC (ICRISAT Sahelian Center)
12. P. Salez	WASIP, Mali
13. P.G. Serafini	ISC
14. D. Sogodogo	IER
15. K. Tadessee	USAID, Bamako
16. A. Traore	IER
17. Kalifa B. Traore	WASIP, Mali
18. R.J. Van Den Beldt	ISC

LECTURES AND FIELD TRIPS

There was a total of 11 lectures and five field visits. The lecture on "Operation Scale Research" was eventually cancelled due to flight problems encountered by the lecturer. Lecture topics ranged from soil fertility, *Striga*, crop and animal interaction to principles of on-farm testing. Lectures usually lasted for one hour followed by questions and discussions. A bilingual resource person from WCASRN was present at all lecture and discussion sessions. A few of the lecturers were bilingual.

Field visits included a trip to the Cinzana station at some 270 km from Bamako, the national program at the Sotuba station just outside Bamako, a special *Striga* field trip at Katibougou, about 70 km north of Bamako, and trials of WASIP at the new site at Samanko, 18 km from Bamako. Lecture topics and field visits are given at the end of the report. The American Ambassador to Mali and some USAID staff joined the group at Samanko.

The Coordinator of WCASRN took the opportunity to meet with the participants on the morning of September 25. The objective of that meeting was to get feedback from the participants on the workshop up to that point and on any problems they were having. It was a very useful interaction with frank exchange of ideas. On the whole, they were quite satisfied. Some of their critical remarks are worth mentioning :

- that more emphasis should have been given to on-farm testing;
- that there should have been more interaction between them and WASIP staff;
- that provision should have been given in the program for each participant to discuss his work.

CLOSING ACTIVITIES

The Team leader of WASIP and the Coordinator of WCASRN hosted a cocktail on Thursday evening, September 28 at the Hotel (Tennessee) where the participants stayed. Guests included USAID Director, the Deputy Director of IER, and several staff from USAID and IER.

The closing ceremony was held on Friday morning, September 29 at 09h00 at the Grand Hotel under the chairmanship of Mr. A. Sow, Chef de Cabinet, at the Ministry of Agriculture. Mr. Sow also distributed the certificates to the participants. The Deputy Director of IER, Mr. D. Diamountene, a representative from USAID, Dr. K. Tadessee, and WASIP's Team Leader were also present. After the opening address by the Coordinator of WCASRN, speeches were given by Dr. Moussa Traore, Chairman of WCASRN's Steering Committee, by a representative of the participants, Mr. Kouadio from Cote d'Ivoire, and by Mr. Sow, the Chef de Cabinet. Refreshments were served at the end.

SAFGRAD/USAID/ICRISAT
West and Central Africa Sorghum Research Network

TRAINING WORKSHOP ON AGRONOMIC RESEARCH AND ON-FARM TESTING

19-30 September, 1989

Bamako, Mali

PROGRAM OF LECTURES AND FIELD VISITS

- Tuesday, 19/9/89 : 08h00 - 08h15 - Welcome remarks. K.V. Ramaiah
08h15 - 08h45 - Opening address. O. Tall
08h45 - 10h15 - Introductory Lecture : Sustainable Agricultural Systems.
J.S. Caldwell
10h15 - 10h30 - Break
10h30 - 12h30 - Soil and Water Management.
K. Tadessee
12h30 - 14h30 - Lunch
14h30 - 16h00 - Soil Fertility Management.
A. Traoré and
M. N'Diaye
16h00 - 16h15 - Break
16h15 - 17h15 - Discussions.
- Wednesday, 20/9/89: 07h30 - 12h30 - Field visit Sotuba. Soil and water, and fertility management.
A. Traoré and M. N'Diaye
14h30 - 16h30 - Agroforestry. R.J. Van Den Beldt
16h00 - 16h15 - Break
16h15 - 17h15 - Discussions.
- Thursday, 21/9/89 : 08h00 - 10h00 - Design of experimentation.
M. Goita
10h00 - 10h15 - Break
10h15 - 11h15 - Discussions
11h15 - 14h00 - Lunch
14h00 - 16h00 - Striga. K.V. Ramaiah,
G. Hoffmann, and I. Dembélé
16h00 - 16h15 - Break
16h15 - 17h15 - Discussion.
- Friday, 22/9/89 : NATIONAL HOLIDAY.
- Saturday, 23/9/89 : 07h30 - 12h30 - Field visit Striga. G. Hoffmann and I. Dembélé
- Sunday, 24/9/89 : FREE.
- Monday, 25/9/89 : 08h00 - 10h00 - Operation Scale Research.
C. Renard
10h00 - 10h15 - Break
10h15 - 11h15 - Discussion
11h15 - 14h00 - Lunch Break

14h00 - 16h00 - Research Station Management.
P.G. Serafini
16h00 - 16h15 - Break
16h15 - 17h15 - Discussion.

Tuesday, 26/9/89 : 07h30 - 10h30 - Travel to Cinzana
10h30 - 12h30 - Visit Cinzana Station.
P.G. Serafini
12h30 - 14h30 - Lunch at Cinzana
14h30 - 17h30 - Travel to Bamako.

Wednesday, 27/9/89: 08h00 - 11h00 - Crop and Animal Interaction.
P. Bartholomew
11h00 - 11h15 - Break
11h15 - 12h15 - Discussion
12h15 - 14h00 - Lunch Break
14h00 - 16h00 - Improved Weed Management.
Diarra
16h00 - 16h15 - Break
16h15 - 17h15 - Discussion.

Thursday, 28/9/89 : 08h00 - 12h00 - Field visit Sotuba. Weed
management. A. Diarra and A. Konaté
12h00 - 14h00 - Lunch Break
14h00 - 16h00 - On-farm Testing. C. Reddy and
M. Kadhi
16h00 - 16h15 - Break
16h15 - 17h15 - Discussion.

Friday, 29/9/89 : 08h00 - 09h00 - Distribution of Certificates. A
Member of the Ministry of Agri-
culture's Cabinet
09h00 - 10h15 - Crop associations. D. Sogodogo
10h15 - 10h30 - Break
10h30 - 10h45 - Travel to Sotuba.
10h45 - 12h30 - Field visit crop association -
Sotuba
12h30 - 14h30 - Lunch break
15h00 - 17h00 - Field visit crop association -
Samanko. K. B. Traoré

Saturday, 30/9/89 and Sunday 1/10/89 : Departures.

RESEAU SAFGRAD/USAID/ICRISAT DE RECHERCHE
SUR LE SORGHO EN AFRIQUE OCCIDENTALE
ET CENTRALE

SAFGRAD/USAID/ICRISAT WEST AND CENTRAL
AFRICAN SORGHUM RESEARCH NETWORK

ATELIER DE FORMATION SUR LA RECHERCHE AGRONOMIQUE
ET LES TESTS EN MILIEU PAYSAN

TRAINING WORKSHOP ON AGRONOMIC RESEARCH AND
ONFARM TESTING

19-30 Septembre, 1989
Bamako, MALI

Programme modifie pour le jeudi 28/9/89 apres-midi et vendredi 29/9/89

Modified program for Thursday afternoon 28/9/89 and Friday 29/9/89

Jeudi apres-midi/Thursday afternoon 28/9/89

- 14h00 - 15h30 : Test en milieu paysan
Onfarm testing
- 15h30 - 16h00 : Discussions
- 16h00 - 16h15 : Pause/Break
- 16h15 - 17h30 : Associations de cultures
Cropping systems
A. Sogodogo
- 17h30 - 18h00 : Discussions

Vendredi/Friday, 29/9/89

- 09h00 - 11h00 : Ceremonie de cloture et distribution
des certificats au Grand Hotel
Closing ceremony and distribution of
certificates
- 11h00 - 11h15 : Voyage sur Sotuba
Travel to Sotuba
- 11h15 - 12h30 : Visite de champ - Association de
cultures (Sotuba)
Field visit - cropping systems (Sotuba)
- 12h30 - 14h15 : Pause Dejeuner
Lunch Break
- 14h15 - 15h00 : Voyage sur Samanko
Travel to Samanko
- 15h00 - 17h30 : Visite de champs - Association de
cultures et des autres essais a Samanko
Field visit - Cropping systems and other
trials at Samanko.

TRAINING WORKSHOP ON AGRONOMIC RESEARCH AND
ON-FARM TESTING

19 - 30 September, 1989

Bamako, MALI

Closing ceremony - at Grand Hotel, Bamako

Friday, 29 September 1989 at 09H00

Chairman : Chief of Cabinet of the Ministry of Agriculture

09H00 - 09H05 : Opening Speech by the Coordinator,
Dr. M.D. THOMAS

09H05 - 09H20 : Speech by the Chairman of the Steering Committee
of the West and Central Africa Sorghum Research
Network

09H20 - 09H35 : Distribution of certificates

09H35 - 09H50 : Speech by a representative of the participants

09H50 - 10H05 : Closing speech by Chief of Cabinet of the
Ministry of Agriculture, Mr. Sow

10H05 - 11H00 : Refreshments.

OPENING ADDRESS
by Dr. Melville D. Thomas
Coordinator WCASRN

(Translated from French)

Excellency the Chief of Cabinet, Ministry of Agriculture,
Excellency Director of USAID,
Participants to the workshop,
Honorable persons invited,
Ladies and Gentlemen,

It is a great pleasure for me to welcome you at the closing ceremony of the training workshop on Agronomic Research and On-Farm Testing, organized by the SAFGRAD/USAID/ICRISAT's West and Central Africa Sorghum Research Network. We are really pleased to have with us this morning, Mr. Sow, Chief of Cabinet at the Ministry of Agriculture.

Last year in Cameroon, the general network workshop decided to organize a training workshop on Agronomic Research and On-Farm Testing. A few days ago, several persons worked hard with us and contributed to the success of this workshop. I would like to mention especially the tight collaboration with the National program of Mali. But above all this, I am very pleased to notice that different institutions (such as USAID, SAFGRAD, IER, ILCA and ICRISAT) of different origins, nationalities and disciplines have worked together for the success of this workshop.

Research networks, in spite of their location are always the same, in the sense that they automatically gather sets of disciplines in order to study problems related to a crop or given crops. In the case of West and Central Africa, we hope that the sorghum research network will play an important role in assembling national expertise for the common welfare of the region.

I would like to seize the opportunity to introduce Dr. Moussa Dossolo Traore. Dr. Traore, a Malian citizen is an expert in Plant Physiology with lots of experience on sorghum. He is also the Chairman of the Sorghum Network Steering Committee. I collaborate very well with him and I think that electing him to chair the network was a good choice.

Finally, I would like to thank the participant for their good collaboration and comprehension with us in ICRISAT. I wish them success in all their future research endeavors.

Thank you.

ADDRESS BY Dr. Moussa D. TRAORE
Chairman of the Steering Committee
of WCASRN

(Translated from French)

Excellency the representative of the minister of Agriculture,
Excellency the Representative of USAID,
Excellency the lecturers to the workshop,
the participants to the workshop,
Ladies and Gentlemen,

I am very happy to be associated with the present closing ceremony after two weeks of fruitful exchange between sorghum specialists of the sub-region.

In fact, considering the multiplicity of biotic and abiotic restraints to the development of the sorghum crop which constitutes the main staple food of the population in our zone, it is essential that scientists join their efforts and experience in order to control these effects. In other words, let us enumerate the constraints due to drought, insects pests, grain quality, low fertility of soils, Striga, etc. The main objectives of the West and Central Africa Sorghum Research Network consist of applying the interaction of research facilities of different member countries:

- by strengthening National Agricultural Research Systems,
- by favoring the flow of ideas and technologies by organizing:
 - * regional lectures where research results of member countries as well as regional centers are presented. The last conference was held in September 1988 at Maroua in Cameroon;
 - * regional trials including the best technologies in the sub-region for a given constraint in multilocational trial in all the member countries;
 - * visit of sorghum programs of some countries by scientists from several member countries. Sorghum programs of Mali, Burkina Faso and Niger will be visited in October by scientists coming from Benin, Burkina, Cameroon, Guinea, Mali, Chad and Togo;
 - * training workshop gathering national and international scientists for exchange of information and experience about priority things for the region such as the one you just participated in during the last few days. I would like to encourage you to make the best use of the acquired knowledge for an adaptation of the techniques in your respective disciplines and programs.

In other words, the Network has undertaken actions to search for fundings to strengthen national agricultural research systems. The member countries, in this framework, would be grouped into technology generation and technology adapting centers.

Our Network has seventeen countries from West and Central Africa. It benefits from the financial support from USAID and the collaboration of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) which assures the coordination, and of OAU/CSTR SAFGRAD. In addition it is worth mentioning that our network benefits from the assistance of the two regional sorghum research programs of ICRISAT, one based at Kano, Nigeria and the other at Samanko, Mali.

Our Network would be what we will make out of it. All the same, I would like to invite you all to be our speakers next to the national agricultural research systems in order to reinforce more their interest and participation in the network activities, so that all together, we could make a better tool of it by setting up efficient technologies which are useful to the farmers in the process of developing farming systems which are self-sufficient and self-sustainable.

On behalf of the network, I would like to thank all the people who contributed directly or indirectly to make this workshop a success.

I would like to apologize for the imperfections which were due to our lack of sufficient experience.

Thank you.

CHIEF OF CABINET SPEECH
CLOSING CEREMONY OF TRAINING WORKSHOP
ON AGRONOMIC RESEARCH AND ON-FARM TESTING

(Translated from French)

Excellency the Team Leader of ICRISAT Regional Program,
Excellency the Coordinator of SAFGRAD/USAID/ICRISAT West and
Central Africa Sorghum Research Network,
Excellency the Chairman of the Steering Committee of the Network,
the Participants to the workshop,
Honorables persons invited,
Ladies and Gentlemen,

It is a real pleasure for me, on behalf of the Ministry of Agriculture, to chair the closing ceremony of this important training workshop on Agronomic Research and On-farm Testing organised by the SAFGRAD/USAID/ICRISAT West and Central Africa Sorghum Research Network.

As you may know, sorghum is an important crop in the 17 West and Central Africa member countries of the Network. This shows the particular interest for this workshop for which several scientists and agronomic research specialists participated. The participation has been active and satisfactory considering that 9 out of 10 countries invited in the workshop. I would also like to add that the lecturers were well qualified and I would like to say that this workshop has been successful based upon the above criteria.

This workshop has been the very first one organised at the "technician" level in Mali since the installation of ICRISAT Regional Program in Mali 19 months ago. It occurs almost at the same time just a year after that organised in September 1988 in Cameroon where 14 out of 17 Network member countries were present. All the same, this workshop which results from the recommendations of the last Steering Committee meeting held in May 1989 here in Bamako, is of primary importance. It will be followed by the Monitoring Tour next October to national programs of Mali, Burkina Faso and Niger by participants from the 7 remaining member countries not invited to the workshop.

We hope that ICRISAT Regional Program officials, particularly, the Sorghum Network Coordinator will put forth every effort for the success of weaker national programs, one of the essential objectives of the Network.

As far as I am concerned, I am particularly honored and proud to notice the presence of Malian scientists as lecturers. This implies two factors of importance : our scientists' experience in the field of agronomic research and the confidence and interest ICRISAT has placed in the National Program of Mali. We hope to see one day that Gambia, Guinea Bissau or Sierra Leone, with weaker national programs in the sorghum research, shelter training workshops of this importance with their national scientists as lecturers.

We finally hope that the participants to this workshop in returning in their respective countries will communicate what they learned. They will thus participate to the development of their national programs which is one of the essential objectives of the Sorghum Network. I will rely on the efforts of you all for the establishment of a strong Regional Sorghum Network lead by national scientists. This will certainly allow in the future the substitution of ICRISAT scientists by national ones who would have acquired some experience.

In conclusion, this training workshop which has been the foundation stone among you "technicians" here present should be fruitful by the exchange of experience and information on your research activities. I wish you good luck on returning to your respective countries and declare closed the training workshop.

Bamako, September 29, 1989.

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

**Semi-Arid Food Grain
Research and Development
(SAFGRAD)**

**WEST AND CENTRAL AFRICAN SORGHUM RESEARCH NETWORK
(WCASRN)**

ICRISAT - WASIP - MALI

ATTESTATION

We certify, Coordinator SAFGRAD/ICRISAT of the West and Central African Sorghum Research Network (WCASRN) and Team Leader of WASIP-Mali, that

M. _____

participated in our training workshop on " Agronomic Research and On farm Tests " from 18 to 30 September 1989.

Issued at Bamako _____

Team Leader
KALUVA V. RAMAIAH

Coordinator SAFGRAD / ICRISAT
MELVILLE D. THOMAS

**Institut International de Recherche
sur les Cultures des Zones
Tropicales Semi - Arides
(ICRISAT)**

**Recherche et Developpement
des Cereales des Zones
Semi-Arides
(SAFGRAD)**

**RESEAU DE RECHERCHE SUR LE SORGHO EN AFRIQUE
OCCIDENTALE ET CENTRALE
(WCASRN)
ICRISAT - WASIP - MALI**

ATTESTATION

Nous soussignons, Coordinateur SAFGRAD/ICRISAT du Reseau de Recherche sur le Sorgho en Afrique Occidentale et Centrale (WCASRN) et Chef d'Equipe du WASIP-Mali, attestons que M. _____

a participe à notre Atelier de Formation sur " Recherche Agronomique et Tests en Milieu Paysan " du 1 au 30 Septembre 1989.

En foi de quoi, nous lui delivrons la présente attestation pour servir et valoir ce que de droit.

Fait à Bamako le _____

Le Chef d'Equipe
KALUVA V. RAMAIAH

Le Coordinateur SAFGRAD/ICRISAT
MELVILLE D. THOMAS

ANNEX 2. REGIONAL TRIALS

LIST OF COLLABORATORS

<u>Country</u>	<u>Name</u>
1. Benin	Dossou Yovo Sigisbert
2. Burkina Faso	F. Kamboui Zangre Roger J. Chantereau S. Da A. Neya
3. Cameroon	Aboubakar Agni Laydo O.P. Dangi
4. Central African Republic	Yong-Monamum Alain-Blaise
5. Côte d'Ivoire	Assamoi François
6. The Gambia	Albert Cox
7. Ghana	Walter Froelich
8. Guinea Bissau	Isabelle Miranda
9. Guinea	Banou Keïta Mamby Keïta
10. Mali	Moussa Diarra Aboubakar Touré I. Konaté Salimata Coulibaly A. Sy
11. Mauritania	Sow Abdoulaye
12. Niger	J. Clark I. Kapran
13. Nigeria	C.C. Nwasike
14. Senegal	Gilles Trouche
15. Sierra Leone	M. Juru D. Taylor
16. Chad	Y. Djekoukousse
17. Togo	Toky Payaro H. Reneaud

INSTITUTION OR COUNTRY OF ORIGIN OF VARIETIES
AND HYBRID IN TABLES 1 TO 3

<u>Variety/hybrid</u>	<u>Institution/country</u>
ICSV and ICSH lines	ICRISAT
IS lines	ICRISAT germplasm
CS lines	Cameroon
CE lines	Senegal
F2-20	Senegal
Lekwere Bedha	Mauritania
Babana Beida	Mauritania
Niobougou	Mauritania
Takmalit	Mauritania
BF lines	Burkina Faso
NSV 1	Ghana
Nagawhite	Ghana
Blanc de Karimana	Benin
IRAT 204	IRAT/CIRAD, Burkina Faso
Sepon 82	Niger
2T x 623A x MR 732	Niger
T x 631A x SUCR 36	Niger

WEST AND CENTRAL AFRICA
SORGHUM RESEARCH NETWORK
(WCASRN), B.P. 320, BAMAKO,
MALI

RESEAU OUEST ET CENTRE
AFRICAIN DE RECHERCHE SUR
LE SORGHO (ROCARS)
B.P. 320, BAMAKO, MALI

TECHNICAL INFORMATION BULLETIN
ON PROMISING VARIETIES TESTED
BY THE NETWORK

FICHE TECHNIQUE SUR LES
VARIETES PROMETTEUSES
TESTEES PAR LE RESEAU

NAME OF VARIETY/NOM DE LA VARIETE:

1. ORIGIN/ORIGINE:

2. BOTANIC CLASSIFICATION/
CLASSIFICATION BOTANIQUE:

3. IMPORTANT CHARACTERISTICS/
PRINCIPALES CARACTERISTIQUES:

- Seedling vigor/Vigueur à la levée:
- Photosensitivity/Photosensibilité:
- Cycle, 50% flowering (in days)/
Cycle, 50% floraison (en jours):
- Cycle, at maturity (in days)/
Cycle, à la maturité (en jours):
- Plant height from base of panicle (in cm)/
Hauteur de la plante à partir de la base de
la panicule (en cm):
- Anthocyanin color on leaves/Couleur anthocyanée
sur feuilles:
- Resistance to leaf diseases/
Résistance aux maladies foliaires:
- *Striga*:
- Lodging/Verse:
- Panicle exertion/Exertion paniculaire:
- Panicle form/Type de panicule
- Grain color, size, weight/Couleur des grains,
dimension et poids:
- Acceptance as food/Acceptation gustative:
- Yield (mean from 2 years)/
Rendement (moyenne de 2 ans):
- Rainfall zone/Zone de culture:
- Planting date/Date de semis:
- Resistance to stem insects/
Résistance aux insectes des tiges:
- Resistance to panicle insects/
Résistance aux insectes de la panicule:
- *Testa*:
- Germination % of one year old seed stand establishment/
% de germination d'une semence d'un an à la levée:
- Decortication of yield/Decorticage du rendement:
- Panicle diseases - grain mold/
Maladies de la panicule - moisissure des grains:
- Food quality/Qualité alimentaire:
- Endosperm texture/Texture de l'endosperme:

**VARIETIES UNDER CONSIDERATION BY SOME
NATIONAL PROGRAMS FOR FURTHER
EVALUATION AND TESTING**

<u>Country</u>	<u>Variety</u>
Burkina Faso	ICSV 1002 BF, ICSV 1049 BF, Framida, ICSV 126 IN, ICSV 16-5 BF, ICSV III IN
Niger	Sepon 82, ICSV 1007 BF, S-35
Ghana	ICSV III IN, ICSV 1087 BF, ICSV 1078 BF, ICSV 16-5 BF, ICSV 210 IN, ICSV 1054 BF, ICSV 1093 BF, ICSV 1063 BF, ICSV 1089 BF, ICSV 1092
Togo	ICSV III IN, M 66118, Sepon-82, ICSV 1007 BF.
Côte d'Ivoire	ICSV 1063 BF, Mali Sor 84-1
Nigeria	ICSV 1002 BF and ICSV 1007 BF
Sierra Leone	Malisor 84-7
Guinea-Bissau	ICSV 126 IN and ICSV 1074 BF
Central African Republic	ICSV 1063 BF and ICSV 1093 BF
Mali	ICSV 1063 BF and ICSV 1079 BF

ANNEX 3 - COLLABORATIVE RESEARCH
PROJECTS

WCASRN COLLABORATIVE RESEARCH PROJECT FORMAT. Starting date:

Title:

Lead Scientist:

Training component:

Objective(s):

Techniques:

Expected Project Impact:

WCASRN Coordinator

Chairman WCASRN
Steering Committee

Lead Scientists

Date _____

WCASRN NETWORK ANNUAL PROJECT PROGRESS REPORT

Period: _____

Title

Status :
Completion: _____

Scientists:

Progress Report:

Training: Number of people: _____ % of project resources: _____

Work plan for next year:

Steering Committee recommendation:

Publication:

WCASRN Coordinator

Chairman WCASRN
Steering Committee

Lead Scientist

Date: _____

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

USAID/OUA-STRC/SAFGRAD/ICRISAT
Projets de Collaboration de Recherche

FORMULAIRE DE JUSTIFICATION DES DEPENSES

1. Titre du projet : _____

2. Chercheur principal : _____
3. Pays : _____
4. Durée du projet : _____
5. Réçus joints _____ Oui _____ Non
6. Détails des dépenses (remplir là où c'est nécessaire)

<u>Poste Budgetaire</u>	<u>Coût en CFA</u>
1. Equipements	_____
2. Fournitures	_____
3. Salaires (Technicien)	_____
4. Salaires (Main d'oeuvre)	_____
5. Voyage (Hotel, per diem)	_____
6. Essence	_____
7. Reparation du véhivule	_____
8. Reparation de la mobylette	_____
9.	_____
10.	_____
11. Autres	_____
(spécifier)	
Dépenses totales	_____
Montant réçu	_____
Solde	_____

7. Signature du chercheur principal _____
8. Nom du Directeur de recherche ou du Chef de la station de recherche _____
9. Signature du Directeur de recherche ou du Chef de la station de recherche _____
10. Date _____
10. Cachet approprié

ANNEX 4. REPORT ON MONITORING TOUR

SAFGRAD/USAID/ICRISAT

WEST AND CENTRAL AFRICA SORGHUM
RESEARCH NETWORK

MONITORING TOUR : October 9-18, 1989

A SUMMARY OF ACTIVITIES

November, 1989

INTRODCUTION

At the regional workshop of the West and Central Africa Sorghum Research Network (WCASRN) held in Maroua, Cameroon, on 20-23 September, 1988, it was agreed that another monitoring tour be conducted in 1989. The 5th Steering Committee Meeting of WCASRN held in Bamako, Mali, from 9 to 11 May, 1989, recommended that the monitoring tour should be organized between 2 and 10 October, 1989. In consultation with the SAFGRAD Coordination Office (SCO) in Ouagadougou, the Tour was held between 9 and 18 October. The objectives of the Tour were :

- to enable national scientists to visit trials and nurseries of neighboring National Agricultural Research Systems (NARS);
- to give national scientists the opportunity to evaluate breeding materials and to select those they find interesting for use in their programs.

National programs of Mali, Burkina Faso, and Niger were visited. The Tour started in Mali and ended in Niger.

THE PARTICIPANTS

Seventeen countries are members of WCASRN. The seven member countries which were not invited to the training workshop on Agronomy and on-farm testing participated in the tour. These seven countries and the names of their respective representatives are given below :

<u>COUNTRY</u>	<u>NAME</u>
Benin	Sigisbert DOSSOU-YOVO
Burkina Faso	Adama NEYA
Cameroon	NGoumou NGa TITUS
Guinea	Gnagna BALAMOU
Mali	Mme COULIBALY Salimata Sidibé
Tchad	-YAGOUA NDjekoukousse
Togo	MPo BATOUSSI.

The participants from Benin and Guinea arrived a few days late in Bamako. Arrangements were made for them to fly from Bamako to Niamey where they joined the group for the Niger portion of the Tour.

OTHER PERSONNEL IN THE TOUR

- J. Clark : Sorghum Breeder, National Program of Niger and WCASRN Steering Committee member. Coordinated the Niger portion of the Tour.
- I. Kapran : National Program of Niger. Sponsored by USAID, Niamey
- G. Kingma : USAID/SAFGRAD Project Advisor, SAFGRAD Coordinating Office, Ouagadougou. With the

Tour in Mali, except at Cinzana station and in Burkina Faso, except at Farako-Ba station.

C. Luce : Principal Sorghum Breeder, ICRISAT Regional Program, Bamako.

K.V. Ramaiah : Team Leader and Principal Sorghum Breeder, ICRISAT Regional program, Bamako, with the Tour up to Farako-Ba.

A. Ratnadass : Principal Sorghum Entomologist, ICRISAT Regional Program, Bamako. With the Tour up to Farako-Ba.

H.C. Sharma : Sorghum Entomologist, ICRISAT Center, India. With the Tour up to Farako-Ba.

M. Tandia : WCASRN Bilingual Secretary. Was responsible for administrative and financial aspects of the Tour.

M.D. Thomas : WCASRN Coordinator and Principal Sorghum Pathologist, ICRISAT Regional Program, Bamako. With Tour up to Burkina Faso.

M. Traore : Chairman, WCASRN Steering Committee and Sorghum Physiologist, Mali National Program. With Tour at Sotuba, Mali.

SUMMARY OF ACTIVITIES

Monday, October 9

The participants met at 7h00 at the Sotuba Research Station. Dr. Moussa Traore, Chairman of the Steering Committee welcomed the participants. Despite a shower that morning, the group visited trials of the Mali national program. Various experiments under the following disciplines were visited: Breeding, Entomology, and Agronomy. Participants took notes on the West African Sorghum Variety Adoption Trial (WASVAT) which is coordinated by WCASRN and sent to various national programs in West Africa.

Most of the afternoon was spent at the ICRISAT West African Sorghum Improvement Program's (WASIP) new site at Samanko, some 18 km from Bamako. WASIP Scientists explained their trials in breeding, entomology, pathology, and agronomy.

Tuesday, October 10

Departure from Bamako for Cinzana was delayed for about an hour and a half. The Cinzana station is about 270 Km from Bamako. At the station national scientists explained their trials on breeding and agronomy. ICRISAT Scientists described several of their experiments on entomology and pathology. The group arrived in Bobo-Dioulasso, Burkina Faso at about 20h30.

Wednesday, October 11

National Scientists gave the group an exhaustive and very interesting tour of their trials at the Farako-Ba station. Most of the morning was spent visiting trials on breeding and pathology of the national program. ICRISAT Scientists explained their trials in entomology just before lunch. After lunch, entomology trials of the national program and a Striga experiment of ICRISAT were visited. The Coordinator chaired a discussion session with the participants and the national scientists. A summary of this discussion session is given at the end of this report.

Tuesday, October 12

The group arrived at the Saria station at about 11h00. The emphasis was on breeding trials. A few experiments on a study on multi-variability analysis were also visited. After the field visit, refreshments were provided by the station after which the group left for Ouagadougou. That afternoon, participants met with the International Coordinator of SAFGRAD, Dr. J. Menyonga at his office.

Friday, October 13

The group left Ouagadougou at about 9h00 for Niamey, Niger. A brief stop was made at the Gampela station, a few kilometers from Ouagadougou. At Gampela, the participants saw trials on two main aspects of sorghum; on the variability of the Guiniensis, Dura and Caudatum and on mutation of local germplasm.

Saturday, October 14

Two sub-stations were visited at Lossa and at Tillabery. At both stations trials visited included, advanced yield trial of local varieties, hybrids, and improved and introduced lines.

Sunday, October 15

Most of the day was spent travelling to Maradi. Quick visits were made to a sub-station at Birni-N'Konni.

Monday, October 16

The station at Tarna near Maradi was visited. National Scientists explained experiments on advanced yield trials, preliminary hybrid trials and pedigree selection. The participants had a short meeting with the Director of Tarna Station Dr. G. Gaoh and Dr. J. Clark. Because of the long distance (700 Km) between Niamey and Maradi, it was decided that the trip back to Niamey should be done in two stages. Thus, the group travelled to Birni N'Konni and spent the night there.

Tuesday, October 17

Departure from N'Konni was at about 06h30 and arrival in Niamey was around 13h00.

Wednesday, October 18

The participants visited ICRISAT Sahelian Center ISC at Sadore, some 40 Km from Niamey. They held a meeting with

ISC Acting Director Dr. A. Kumar, Mr. J. Naino, Director of Kolo research station, and Mr. Moussa, Deputy Director of INRAN (Institut National de Recherches Agronomiques du Niger). A courtesy call was made later to the Director of INRAN.

All the participants left Niamey either in the afternoon of October 18 or during the following day, Thursday October 19.

A copy of the program for the Tour and recommendations and some general comments made by the participants at their meetings at Maradi and Sadore are given at the end of the report.

SYNTHESIS OF FARAKO-BA VISIT

Following the Field visits at Farako-Ba station, a meeting was held in the conference room of CERIC. The objective of this meeting was to make comments and suggestions on the monitoring tour up to that point discussions focused on the following aspects :

- absence of agronomic trials at Farako-Ba,
- naming of varieties before their release,
- evaluation of parent samples at each step of selection,
- criteria of variety choice to study the dynamics of stemborers population,
- methodology for a screening technique for resistance to stemborer under managed conditions.

In addition, various suggestions were made to reinforce the network through monitoring tours :

Sorghum Improvement (Breeding)

- interests were shown on the performance of the variety HVS 17,
- research conducted on sorghum breeding at Farako-Ba merits in particular collaborative work between the National Program of Burkina Faso and other national programs,
- the necessity to consider fertilization activities and soil fertility as well in selection of materials,
- studies on Striga should be emphasized considering its importance,
- necessity of introducing local varieties in the breeding programs.

Entomology

- research activities in this field held the attention of most participants,
- necessity to control the dynamics of each insect pest population,
- an understanding of host plant and insect pest relationship through lab and field studies,
- particular interest in the collaboration between national programs and ICRISAT Center.

Phytopathology

- Participants were particularly interested in screening techniques for multiple resistance, participants,
- an approach for a screening technique for multiple resistance should be encouraged in other countries.

Overall, the monitoring tour was an interesting activity for the interaction between West and Central Africa scientists. The participants expressed their interests for such visits and thanked the Coordinator for his devotion.

WEST AND CENTRAL AFRICAN SORGHUM RESEARCH
NETWORK (WCASRN)

MONITORING TOUR : Mali, Burkina Faso, Niger

9 - 18 October, 1989

09/10/89 : 07h30 - 07h35 : Welcome remarks by Dr. Moussa
D. TRAORE, Chairman of West and
Central Africa Sorghum Research
Network Steering Committee

07h35 - 10h30 : Visit of trials - Sotuba
10h30 - 11h00 : Trip to Samanko
11h00 - 13h00 : Visit of trials
13h00 - 13h30 : Lunch break (pocket lunch)
13h30 - 15h30 : Visit of trials and selection of
materials
15h30 : Trip back to city

10/10/89 : 06h30 : Trip from Bamako to Cinzana
09h45 - 11h45 : Visit of trials at Cinzana
11h45 - 12h30 : Lunch break
12h30 - 17h00 : Trip to Bobo Dioulasso,
Burkina Faso

11/10/89 : Visit of trials - Farako-Ba research station

12/10/89 : 06h30 : Trip to Saria
09h30 - 11h30 : Visit of trials at Saria
11h30 - 12h30 : Trip to Ouagadougou

13/10/89 : 07h30 - 08h00 : Visit to SAFGRAD Coordination
Office, Ouagadougou
08h00 - 11h00 : Trip to Fada N'Gouma
11h00 - 12h30 : Lunch break at Fada N'Gouma
12h30 - 16h30 : (17h30 local time) : Trip to
Niamey, Niger

14/10/89 : 07h00 - 08h00 : Trip to Lossa and Tillabery
08h00 - 10h30 : Visit of trials at Lossa and
Tillabery
10h30 - 11h30 : Trip back to Niamey

15/10/89 : 07h00 - 18h00 : Trip to Maradi - Visit of
trials at Birni N'Konni on the way

16/10/89 : Visit of trials at Tarna station
Trip back to N'Konni in the afternoon

17/10/89 : 06h00 - 13h00 : Trip to Niamey

18/10/89 : 08h00 - 09h00 : Visit at Sadore, ICRISAT
Sahelian Center
10h00 - 10h30 : Visit to Director General,
INRAN, Niamey

18/10/89 : afternoon and 19/10/89 : Departures from Niamey

RECOMMENDATIONS

Following the visit to various research stations in Mali, Burkina Faso and Niger, the participants made suggestions to improve future monitoring tours and the Sorghum Network as a whole :

- The participants expressed their gratitude to the research institutions in Mali, Burkina Faso and Niger for the good collaboration they extended to the Sorghum Network.

- They regret the absence of visits to purely agronomic trials. In order to overcome this shortcoming, an intensification of agronomic activities is necessary to ensure the improvement of sorghum in the Network.

- An orientation of the Network towards a better integration of disciplines (Agronomy, breeding, phytopathology, entomology) should be emphasized.

- The circulation of scientific information among Sorghum Network scientists should be reinforced. The Coordinator should ensure a lot of exchange of information among all scientists.

- Particular attention should be given to the potential of local varieties in all research activities.

- A resuffling of Network Steering Committee members in order to ensure representation by only national scientists.

- The elaboration of an integrated control method of crop diseases and pests.

- Future monitoring tours should have rest days for participants in order to ensure better attention on their part.

- The elaboration of a synthesis of research works on Striga and soil fertility. The Network should intensify the collaboration on these activities. ICRISAT could thus be able to focus better on the situation on Striga and soil fertility.

- Research stations should continue to have demonstration plots with outstanding varieties as in the Sorghum-Millet-Maize program in Burkina Faso.

- A close collaboration between breeders and crop protection scientists (phytopathology and entomology) to ensure a constant follow-up of F1 progenies in order to propose materials with multiple resistance.

- The participants addressed special thanks to Mr. Mahamadou TANDIA for his dynamism, his sense of organization and his constant availability and readiness during the tour. Mr. TANDIA, despite the various problems, contributed to ensure the good run the tour.

- Finally, the participants renewed their sincere thanks to Dr. THOMAS for his devotion to work for the reinforcement of the Sorghum Network. The participants wished him good luck in his career at the Head of the Sorghum Network and hope he will give the Network great impetus to make it a success.

ANNEX 5. VISIT TO NARS

USAID/OAU-STRC/SAFGRAD/ICRISAT

RESEAU OUEST ET CENTRE AFRICAIN DE RECHERCHE SUR LE SORGHO

WEST AND CENTRAL AFRICA SORGHUM RESEARCH NETWORK

**TERMS OF REFERENCE FOR VISISTS TO
NATIONAL PROGRAMS**

**GUIDE DE REFERENCE POUR LA VISITE
AUX PROGRAMMES NATIONAUX**

1. The importance of sorghum (area cropped to sorghum, role of sorghum in the diet, market value, national policy on sorghum, etc.);

L'importance du sorgho (surface cultivée en sorgho, place du sorgho dans l'alimentation, prix de vente, politique nationale sur le sorgho, etc.);

2. Research carried out on sorghum;

La recherche conduite sur le sorgho;

3. Research personnel working on sorghum (number, discipline, level of qualification); see attached form to be filled.

Le personnel de recherche travaillant sur le sorgho (nombre, discipline, niveau de formation), ci-joint une fiche à remplir.

4. Major constraints in research and production;

Contraintes majeures de la recherche et de la production.

5. Farmer's perception of sorghum in their cropping systems;

Point de vue des paysans sur le sorgho dans leurs systèmes de production;

6. Immediate and long-term research needs and training according to areas of priority;

Besoins immédiats et à long terme de la recherche et la formation selon les domaines de priorité;

7. Participation in the activities of the West and Central Africa Sorghum Research Network (general workshops, training workshops, monitoring tours, regional trials and nurseries, collaborative research projects).

Participation aux activités du Réseau de Recherche sur le Sorgho en Afrique Occidentale et Centrale (ateliers généraux, ateliers de formation, visites d'observations, essais régionaux et pépinières, projets de collaboration).

8. Field visit and evaluation of the Network trials (if possible).

Visite de champs et evaluation des essais du Réseau (si possible).

USAID/OAU--STRC/SAFGRAD/ICRISAT

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

A. NOM DU PAYS/NAME OF COUNTRY _____

B. DIRECTEUR GENERAL/DIRECTOR _____

Adresse/Address _____

Telephone _____ Telex _____ Fax _____

C. AUTRES PERSONALITES ADMINISTRATIVES/OTHER SENIOR
ADMINISTRATIVE PERSONNEL

1. Nom/Name _____

Adresse/Address _____

Telephone _____ Telex _____ Fax _____

2. Nom/Name _____

Adresse/Address _____

Telephone _____ Telex _____ Fax _____

D. NOM, DIPLOME, DISCIPLINE, SITUATION ACTUELLE (en conge, a la
station, etc.) DES CHERCHEURS DU SORGHO/NAME, DEGREE,
DISCIPLINE, AND CURRENT SITUATION (on leave, at the station)
OF SORGHUM RESEARCHERS

NOM DU PAYS/NAME OF COUNTRY _____

	NOM/NAME	DIPLOME DEGREE	DISCIPLINE	SITUATION ACTUELLE CURRENT SITUATION
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____
13.	_____	_____	_____	_____
14.	_____	_____	_____	_____
15.	_____	_____	_____	_____
16.	_____	_____	_____	_____
17.	_____	_____	_____	_____
18.	_____	_____	_____	_____
19.	_____	_____	_____	_____
20.	_____	_____	_____	_____

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Department of Rural Economy and Agriculture (DREA)

African Union Specialized Technical Office on Research and Development

1990-05

WCASRN, Annual progress report

AU-SAFGRAD

AU-SAFGRAD

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