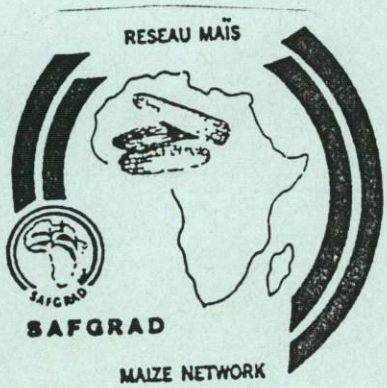
ORGANIZATION OF AFRICAN U
SCIENTIFIC, TECHNICAL AND RESEARCH COMMISSION
(OAU/STRC)

WEST AND CENTRAL AFRICA COLLABORATIVE MAIZE RESEARCH NETWORK



1992 ANNUAL REPORT

SEMI-ARID FOOD GRAIN RESEARCH AND DEVELOPMENT
INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE
SAFGRAD-IITA - 01 B.P. 1783 OR 1495
OUAGADOUGOU 01 - BURKINA FASO

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WEST AND CENTRAL AFRICA MAIZE NETWORK

1992 ANNUAL REPORT

1.0. Collaborating National Programs and National Project Coordinators

Based on production constraints, available research personnel, and infrastructure of each of the Maize Network member countries, technology development responsibilities were assigned to strong national programs (lead centers) in 1987. The understanding has been that each lead center would share with other national programs technologies emanating from its efforts. The collaborative research activities initiated and coordinated by the Maize Network has resulted in the development and exchange of technologies in the member countries. Improved technologies have been proposed and adopted by farmers with the result that maize hectarage in all the 17 Network-member countries have increased. Also, the enhanced interaction among national scientists coupled with the training activities organized by the Maize Network and the technical backstopping provided by IITA scientists and resource persons from Lead NARS have improved the efficiency and effectiveness of research within individual national programs. The Network Lead and Technology Adapting Centers during 1991 were as follows:

1.1. Maize Network Lead Centers

1. Burkina Faso
   - Research responsibilities: Breeding for early and extra-early maize and for drought resistance/tolerance
   - Project Coordinator : Mr. Hema Idrissa
     Station de Kamboinse
     INERA
     B.P. 7192, Ouagadougou

2. Cameroon
   - Research responsibilities : (i) Breeding for maize of different maturities, drought resistance/tolerance and *Striga* tolerance (ii) Agronomy
   - Project Coordinator : Dr. Charles Thé
     IRA/NCRE
     B.P. 2067, Yaoundé

3. Côte D'Ivoire
   - Research responsibilities : Breeding for *Striga* tolerance, stem borer resistance and for maize of different maturities.
   - Project Coordinator : Mr. Attiey Koffi
     IDESSA
     B.P. 633, Bouaké

4. Ghana
   - Research responsibilities : Breeding for maize of different maturities, streak resistance, nitrogen-use efficiency, *Striga* tolerance.
   - Project Coordinator: Dr. P.Y.K. Sallah
     Crops Research Institute
     P.O. Box 3785, Kumasi

5. Nigeria
   - Research responsibilities : Agronomy
   - Project Coordinator : Dr. E.N.O. Iwuafor
     Institute of Agric. Research, Samaru
     PMB 1044, Zaria

6. Togo
   - Research responsibilities : Development of streak resistance screening facilities and breeding for streak resistant and *Striga* tolerant varieties.
   - Project Coordinator : Dr. Esseh-Yovo Mawule
     DRA, B.P. 2318, Lomé

1.2. Technology Adapting Centers

Benin :	Mr. Romuald A. Dossou Station d'Ina B.P. 3, N'Dali
Cape Verde :	Mr. Carlos Silva INIA, B.P. 50, Praia
Central African Republic:	Directeur de la Coordination Agricole Ministère du Développement Rural B.P. 786, Bangui
Gambia :	Mr. Musa S. Mbenga Sapu Agric. Station Dept of Agricultural Research Sapu
Guinea :	Mr. Sekouna Camara Centre Agronomique de Kilissi IRAG, B.P. 576, Conakry
Guinée-Bissau :	Mme Isabel Miranda C.P. 71, Bissau
Mali :	Mr. NTji Coulibaly Station de Sotuba, B.P. 438 Bamako
Mauritania :	Mr. Sidi R'Chid CNRADA, B.P. 22, Kaedi
Niger :	Mr. Jika Naino INRAN, B.P. 429, Niamey
Senegal :	Mr. Abdou Ndiaye ISRA, B.P. 240 CRA/Fleuve Saint Louis
Tchad :	Chef du Bureau de la Recherche Agronomique Ministère de l'Agriculture B.P. 441, N'Djamena

2.0. Network Management

The activities of the Network during the period under review were planned and monitored by the Steering Committee. The eleventh Steering Committee meeting was held during the period.

2.1. Eleventh Steering Committee Meeting

The eleventh of the biannual meetings of the Maize Steering Committee took place on May 19-21 in Ouagadougou, Burkina Faso. The opening session was addressed by the SAFGRAD International Coordinator, the representative of USAID and the IITA Deputy Director General (International Cooperation).

The following people were in attendance:

- Members of the Steering Committee

  Dr. Charles Thé (Cameroon) --Chairman
  Dr. P.Y.K. Sallah (Ghana) --English Secretary
  Mr. Ntji Coulibaly (Mali) --French Secretary
  Dr. E.N.O. Iwuafor (Nigeria)
  Mr. Abdou Ndiaye (Senegal)
  Mr. Romuald A. Dossou (Benin)
  Dr. J.M. Fajemisin --Network Coordinator (out-going)
  Dr. B. Badu-Apraku --Network Coordinator (in-coming).

- Observers and resource persons

  Dr. T. Bezuneh (Director of Research, SAFGRAD, Ouagadougou, Burkina Faso)
  Dr. S.K. Kim (Maize Breeder, Maize Research Program, IITA, Ibadan, Nigeria)
  Mr. E.F. Deganus (Special Projects' Coordinator, International Cooperation IITA, Ibadan, Nigeria)
  Dr. J.M. Menyonga (SAFGRAD International Coordinator)
  Dr. A.C. Schroeder (USAID Consultant for Impact Assessment Study).

The following items of the agenda were discussed at the meeting:

(i) Network Coordinator's report,

(ii) Progress reports on collaborative projects by Steering Committee members,

(iii) Discussion on Network's impact studies,

(iv) Discusssion on ways to sustain network activities,

Highlights of the Steering Committee meeting

1. It was indicated that USAID had made available funds for network activities for the period April to December 1992 but at a reduced level.

2. Results of the regional trials over the past four years showed that there were Pool 16 DT SR varieties which significantly outyielded SAFITA-2. Pool 16 DT SR varieties were in addition, streak resistant whereas SAFITA-2 was not. It was therefore suggested that all countries that had hitherto released SAFITA-2 should consider replacing it with either Kamboinse 88 Pool 16 DT SR or Farako-Bâ 88 Pool 16 DT SR (HD) in order to ensure yield stability.

3. It was announced that the Maize Network Coordinator, Dr. J.M. Fajemisin had been recalled by IITA to head IITA-Station in the Côte D'Ivoire and would therefore leave the network at the end of May. Dr. B. Badu-Apraku from the Ghana maize program had been appointed the new coordinator to replace Dr. Fajemisin.

4. The Steering Committee decided that populations that had been developed for improvement in resistance to drought or experimental varieties derived from such populations should be designated "DT" instead of "DR". This change was necessary since DR designation may be misinterpreted to mean that the

materials are resistant to drought, which is not the case at this stage.

5. IITA borer resistant (BR) materials evaluated in Cameroon and Ghana for resistance to *Eldana saccharina* and *Sesamia calamistis* did not show resistance in the two countries. However, new inbred lines with good levels of resistance to *Sesamia* have been identified by IITA and efforts are being made to improve the level of resistance so that borer resistant hybrids and synthetics could be developed.

6. IITA Maize Program continued to provide effective backstopping to the Maize Network. Apart from germplasm and trials sent to national programs, IITA maize scientists paid consultation visits to several national programs. Also, Dr. Mawule Yovo, the former chairman of the Steering Committee and head of the maize program of Togo joined IITA in April as a visiting scientist for a year.

Recommendations

The Steering Committee after its deliberations came up with the following recommendations.

1. In view of the various pertinent recommendations which have been made by the Steering Committees and which have not been followed through, it is recommended that the SAFGRAD Coordination Office should make an extra effort to ensure that the recommendations are implemented.

2. Considering the problem of loss of valuable breeding materials in many national programs in the sub-region, it is recommended that the Network should assist national programs to upgrade their storage facilities.

3. To promote and sustain the present level of collaboration among NARS in West and Central Africa, it is recommended that the present system of exchange of visits by NARS scientists should be continued.

3.0. Strengthening National Programs

During the eleventh Steering Committee meeting, it was decided that in view of the limited funds available for the extension of the SAFGRAD Project, the Network should concentrate on the following activities in 1992 in an effort to strengthen the national programs:

(1) Regional Trials
(2) Collaborative research activities
(3) Resident research activities
(4) Provision of financial assistance to national programs
(5) Publication of research results and
(6) Network Impact Assessment Study.

This annual report therefore covers these five areas of emphasis.

3.1. Regional Trials

Two types of Regional Uniform Variety Trials (RUVT) were offered in 1992 to collaborators in West and Central Africa covered by the SAFGRAD Maize Network. These included:

- RUVT-Early : Early maturing varieties flowering in about 50 days after planting and producing dry grains in 90-95 days.

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

The composition of each trial is presented in Tables 1 and 2. A randomized complete block design with four replications per site was employed for all the trials. A plot consisted of four 5-metre rows spaced 0.75 m between the rows with within-row spacing of 40 cm. There were 2 plants/stand resulting in a population density of 66,666 plants/ha. Data were recorded on only the two central rows.

A total of 78 sets or RUVT were sent to 18 countries. Further details are shown in Table 3. As at the end of April, 1993, data had been received from 57 sets from 14 countries giving a recovery rate of 73%. Feedback received from Mauritania indicated that excess rainfall and termite damage had led to crop failure. No data were returned by the Gambia, Central Africa Republic and Guinea Bissau.

3.2. Collaborative Research

The collaborative research projects aim at exploiting the strengths of the strong NARS (Lead Centers) for the generation of technologies which can then be shared by network member countries. During the year, the Lead Centers continued to implement research projects that have been assigned to them.

Table 1. Description of entries in RUVT Early, 1992.

ENTRY No	Name	PROPOSED BY	PARENTAGE	GRAIN TYPE
1	FARAKO-BA 88 POOL 16 DT	SAFGRAD	Pool 16 (Tropical Early White Dent)	White-dent
2	KAMBOINSE 88 POOL 16 DT	SAFGRAD	" "	White-dent
3	ACROSS 90 POOL 16 DT	SAFGRAD/NARS	" "	White-dent
4	FARAKO-BA 90 POOL 16 DT (HD)	SAFGRAD/BURKINA	" "	White-dent
5	INA 90 POOL 16 DT	SAFGRAD/BENIN	" "	White-dent
6	KAMBOINSE 90 POOL 16 DT	SAFGRAD/BURKINA	" "	White-dent
7	MAROUA 90 POOL 16 DT	SAFGRAD/CAMEROON	" "	White-dent
8	NYANKPALA 90 POOL 16 DT	SAFGRAD/GHANA	" "	White-dent
9	BDP-SR BC3 F4	SAFGRAD/BENIN	BDP (local variety from Benin), SR donor	White flint
10	FBC 6	BURKINA FASO	A Composite of DMR-ESRY, Rod 6, Rod 12, Revolution précoce, FBC4, Maka, IRAT 217 and TZESR-Y C2.	Yellow semi-flint
11	IKENNE 88 BU-ESR-W	IITA	Back-up pool of early maturing germplasm	White semi-dent
12	MAKA-SR BC3 F4	SAFGRAD/ MAURITANIA	Maka (from Mauritania), SR Donor	Yellow semi-flint
13	TZESR-W-SE	IITA	TZESR-W, Floury gene donor	White floury
14	SAFITA-2 (RE)	SAFGRAD	Pool 16 (Tropical Early White-Dent)	White-dent
15	CHECK	-	Various	Various

Table 2. Description of entries in RUVT Extra-Early, 1992.

ENTRY No.	Name	PROPOSED BY	PARENTAGE	GRAIN TYPE
1	CSP-SR BC3 F4	IITA-SAFGRAD	Compuesto Selection Precoz, SR source	Yellow flint
2	TZEE-W-SR BC3 F4	" "	Local & introduced germplasm, SR source	White semi-dent
3	TZEE-Y-SR BC3 F3	" "	Local & introduced germplasm, SR source	Yellow flint
4	TZESR-W X GUA 314	" "	TZESRW x Columbian germplasm	White flint
5	CSP	" "	Compuesto Selection Precoz	Yellow flint
6	TZEE-W	" "	Local & introduced germplasm	White semi-dent
7	TZEE-Y	" "	Local & introduced germplasm	Yellow flint
8	CSP X L. RAYTIRI	" "	CSP X Local variety	Yellow flint
9	TZEF-Y	" "	Local & introduced germplasm	Yellow flint
10	CHECK	Collaborator	Various	Various

Table 3. Number of sets of Regional Uniform Variety Trials (RUVT) requested by NARS in 1992 and data recovery.

COUNTRY	NUMBER OF TRIALS REQUESTED		
	RUVT-EARLY	RUVT EXTRA-EARLY	TOTAL
BENIN	3	2	5
BURKINA FASO	3	3	6
CAMEROON	3	3	6
CAPE VERDE	1	0	1
CENTRAL AFRICAN REPUBLIC	3	2	5
COTE D'IVOIRE	3	3	6
GAMBIA	2	2	4
GHANA	2	3	5
GUINEA	3	-	3
GUINEA BISSAU	2	3	5
MALI	2	3	5
MAURITANIA	1	1	2
NIGER	2	1	3
NIGERIA	3	3	6
SENEGAL	2	2	4
SIERRA LEONE	2	2	4
TCHAD	2	2	4
TOGO	2	2	4
TOTAL RETURNED	31	26	57
TOTAL DISPATCHED	41	37	78
RECOVERY RATE (%)	76	70	73

The precision level of both RUVT-early and RUVT extra-early continued to be reasonably high with 77% of the trials having CV values of 25% or less. Grain yield and other important agronomic characters recorded at the individual locations as well as the across-location analyses for the locations with CV values of 26% or less are presented in Tables 4 and 5 for the early and extra-early varieties, respectively.

Results of the individual location analyses of grain yield of the early and extra-early maturing varieties showed high grain yields in all locations. It is interesting to note the exceptionally high grain yield produced by the extra-early varieties at Garoua and Soucoundou (Cameroon), Farako-Bâ (Burkina Faso), and Sotuba (Mali). This is a clear demonstration of the high yield potential of the extra-early varieties under favorable growing conditions.

The across-location analyses of grain yield of the early maturing varieties revealed Across 90 Pool 16 DT as the highest yielding entry and BDP-SR BC3 F4 as the lowest yielder. However, no differences were detected among the first four top yielders. It is interesting to note that several versions of Pool 16 DT significantly out-yielded SAFITA-2, a streak susceptible check extracted from Pool 16. This confirms the earlier findings and emphasizes the need for all countries which have released SAFITA-2 to replace it with one of the streak resistant versions of Pool 16 DT in order to ensure yield stability.

Table 4. Grain yield (t/ha at 15% moisture) of varieties tested in RUVT Early trial in 1992 at 17 locations in 10 countries and across-location means for days to 50% silking, plant stand, plant height, ear height, and the number of plants and ears harvested.

VARIETIES	LOCATIONS								
	BENIN		BURKINA FASO		COTE D'IVOIRE	GUINEE CKRY		GHANA	
	1	2	3	4	5	6	7	8	9
2 KAMBOINSE 88 POOL 16 DT	4.67	5.71	6.60	4.76	3.75	5.30	4.35	3.78	4.59
3 ACROSS 90 POOL 16 DT	4.59	5.50	6.59	4.73	3.70	4.98	4.31	3.77	4.58
11 IKENNE 88 BU-ESR-W	3.90	4.76	5.70	4.30	3.21	4.67	4.07	3.27	4.16
1 FARAKO-BA 88 POOL 16 DT(HD)	4.88	5.87	7.05	4.92	3.85	5.30	4.41	3.89	4.68
9 BDP-SR BC3 F4	4.13	4.89	6.03	4.43	3.34	4.75	4.10	3.37	4.24
7 MAROUA 90 POOL 16 DT	4.28	5.01	6.22	4.53	4.45	4.77	4.16	3.48	4.32
10 FBC 6	3.95	4.76	5.72	4.30	3.32	4.75	4.09	3.33	4.23
4 FARAKO-BA 90 POOL 16 DT(HD)	4.50	5.15	6.34	4.61	3.70	4.91	4.29	3.75	4.57
14 SAFITA-2 (RE)	3.38	4.15	5.30	4.17	2.64	3.71	3.85	3.25	3.97
8 NYANKPALA 90 POOL 16 DT	3.25	4.90	6.16	4.47	3.34	4.77	4.10	3.44	4.26
5 INA 90 POOL 16 DT	4.39	5.04	6.34	4.61	3.63	4.85	4.23	3.67	4.54
6 KAMBOINSE 90 POOL 16 DT	4.34	5.03	6.31	4.61	3.61	4.85	4.17	3.50	4.51
15 EARLY THAI	3.18	3.90	5.10	4.04	1.13	3.52	3.50	2.27	3.78
13 TZESR-W-SE	3.57	4.57	5.40	4.23	3.09	4.18	4.04	3.25	4.06
12 MAKA-SR BC3 F4	3.58	4.59	5.69	4.25	3.10	4.32	4.07	3.27	4.11
LSD 5%	1067	939.9	978	NS	690.9	506.1	696.6	847.3	677.4
PROB. OF F	0.071	0.009	0.011	0.028	0.000	0.000	-	0.239	0.270
COEFF. OF VARIATION	18.2	13.4	11.4	16.6	14.9	7.7	11.9	17.3	11.0

Location codes: 1 = Angaradebou, 2 = SRCV-Ina, 3 = Farako-Bâ , 4 = Kamboinse, 5 = Bouaké, 6 = CRA Kilissi, 7 = Manga-Bawku, 8 = Nyankpala, 9 = Wa, 10 = Kita 11 = Sotuba, 12 = Bengou, 13 = Nioro du RIP, 14 = Dougui, 15 = Gassi, 16 = Broukou, 17 = Tantiegou.

Table 4. (Cont'd)

VARIETIES	LOCATIONS							
	MALI		NIGER	SENEGAL	TCHAD		TOGO	
	10	11	12	13	14	15	16	17
2 KAMBOINSE 88 POOL 16 DT	3.96	8.10	3.38	3.97	3.56	5.34	4.26	5.92
3 ACROSS 90 POOL 16 DT	3.76	8.06	3.25	3.85	3.34	5.04	4.21	5.15
11 IKENNE 88 BU-ESR-W	3.36	7.08	2.28	3.51	2.56	4.27	3.76	4.24
1 FARAKO-BA 88 POOL 16 DT(HD)	4.45	8.64	3.85	4.05	3.75	5.48	4.32	6.21
9 BDP-SR BC3 F4	3.49	7.38	2.51	3.64	2.69	4.59	3.84	4.32
7 MAROUA 90 POOL 16 DT	3.61	7.39	2.66	3.74	2.76	4.81	3.92	4.53
10 FBC 6	3.47	7.27	2.37	3.64	2.68	4.31	3.79	4.29
4 FARAKO-BA 90 POOL 16 DT(HD)	3.75	7.73	2.96	3.82	3.23	5.00	4.13	4.93
14 SAFITA-2 (RE)	3.15	6.47	2.21	3.23	2.34	2.97	3.47	3.57
8 NYANKPALA 90 POOL 16 DT	3.61	7.38	2.61	3.72	2.70	4.70	3.84	4.32
5 INA 90 POOL 16 DT	3.73	7.67	2.87	3.79	2.85	4.94	4.03	4.93
6 KAMBOINSE 90 POOL 16 DT	3.70	7.46	2.80	3.76	2.85	4.81	4.00	4.80
15 EARLY THAI	2.24	5.62	2.19	2.73	1.68	2.58	3.39	2.75
13 TZESR-W-SE	3.15	6.74	2.32	3.25	2.45	3.24	3.68	3.60
12 MAKA-SR BC3 F4	3.15	6.91	2.25	3.43	2.45	3.96	3.84	3.84
LSD 5%	901.2	1006	902	1149	1.089	793.3	528.8	348.5
PROB. OF F	0.036	0.000	0.014	-	0.000	0.001	0.024	0.000
COEFF. OF VARIATION	19.4	9.6	23.4	22.3	17.3	19.9	9.5	54

Location codes: 1 = Angaradebou, 2 = SRCV-INA, 3 = Farako-Bâ, 4 = Kamboinsé, 5 = Bouaké, 6 = CRA-Kilissi, 7 = Manga-Bawku, 8 = Nyankpala, 9 = Wa, 10 = Kita, 11 = Sotuba, 12 = Bengou, 13 = Nioro du RIP, 14 = Dougui, 15 = Gassi, 16 = Broukou, 17 = Tantiegou.

Table 4. (cont'd).

VARIETIES	VARIETY MEAN						
	GRAIN YIELD (t/ha)	50% SILK (days)	PL. ST (cm)	PL. HT (cm)	E. HT (cm)	P. HARV ('000/ha)	E. HARV ('000/ha)
3 ACROSS 90 POOL 16 DT	4498	53	43	167	76	46	45
11 IKENNE 88 BU-ESR-W	4496	54	43	173	76	47	45
8 NYANKPALA 90 POOL 16 DT	4491	53	44	173	82	47	46
2 KAMBOINSE 88 POOL 16 DT	4453	53	43	172	81	46	45
7 MAROUA 90 POOL 16 DT	4434	52	43	165	76	47	46
5 INA 90 POOL 16 DT	4277	52	44	170	78	47	45
4 FARAKO-BA 90 POOL 16 DT(HD)	4268	53	43	168	76	47	45
12 MAKA-SR BC3 F4	4265	55	43	183	88	46	44
10 FBC 6	4192	56	43	188	91	46	42
6 KAMBOINSE 90 POOL 16 DT	4175	52	44	163	73	47	45
1 FARAKO-BA 88 POOL 16 DT(HD)	4162	53	43	166	73	46	43
14 SAFITA-2 (RE)	4116	53	44	164	75	46	45
13 TZESR-W-SE	3968	54	43	170	77	46	43
15 CHECK	3863	54	40	164	74	42	39
9 BDP-SR BC3 F4	3856	54	43	191	97	47	45
LSD 5%	204.7	0.6	0.9	4.3	3.5	1.1	1.4
PROB. OF F	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COEFF. OF VARIATION	14.4	3.4	6.5	7.4	13.2	7.3	9.6

Table 5. Grain yield (t/ha at 15% moisture) of varieties tested in RUVT Extra-Early trial in 1992 at 12 locations in 7 countries and across-location means for days to 50% silking, plant height, ear height, and the number of plants and ears harvested.

VARIETIES	LOCATIONS											
	TOGO		BURKINA FASO	GHANA			MALI		TCHAD	BENIN	CAMEROON	
	1	2	3	4	5	6	7	8	9	10	11	12
4 TZESR X GUA 314	3893	3520	6007	3351	2948	3467	3520	6458	2867	2323	6181	4019
5 CSP	3760	3707	5016	2890	3386	3077	4053	6835	2653	2930	5921	4405
2 TZEE-W-SR BC3 F4	3547	3467	5477	3108	3565	3835	3520	7137	3360	3518	6161	3880
8 CSP X L. RAYTIRI	3493	4053	4969	2993	2932	2889	3706	6413	3080	2644	5957	5099
9 TZEF-Y	3440	3673	4787	3333	2837	3016	3973	6123	2827	2066	5646	4831
1 CSP-SR BC3 F4	3360	4347	4740	3464	3329	3518	4347	6111	2667	2829	5821	3964
3 TZEE-Y-SR BC3 F4	3093	3387	4284	3691	2424	2155	2960	5017	2867	2544	4801	4174
10 CHECK	2907	2960	3217	3728	4144	4579	3386	5589	2680	2579	6103	4245
6 TZEE-Y	2640	3333	2991	2882	2471	2247	3307	4295	2493	3223	4328	4036
7 TZEE-Y	2427	3307	3563	3067	2372	1747	3333	5073	2920	2301	4229	4109
LSD 5%	705.7	773.7	927.9	381.6	548.7	735.6	1068	943.4	711.1	940.0	1283	1146.0
PROB. OF F.	0.003	0.037	0.000	0.000	0.000	0.000	0.356	0.000	0.041	0.103	0.012	0.004
COEFF. OF VARIATION	14.9	14.8	14.2	8.1	12.4	16.6	17.2	11.0	17.1	24.0	16.3	14.3

Location codes: 1 = Broukou, 2 = Tantiegou, 3 = Farako-Bâ, 4 = Nyankpala, 5 = Manga-Bawku, 6 = Wa, 7 = Massantola, 8 = Sotuba, 9 = Dougui, 10 = Angaradebou, 11 = Garoua, 12 = Soucoundou.

Table 5. (Cont'd).

VARIETIES	VARIETY MEAN						
	GRAIN YIELD (t/ha)	DYS. SLK (days)	PL. ST (cm)	PL. HT (cm)	E. HT (cm)	P. HARV ('000/ha)	E. HARV ('000/ha)
2 TZEEW-SR BC3 F4	4090	47	48	160	67	47	45
4 TZESR-W X GUA 314 BC1 F7	3885	49	46	153	59	44	42
5 CSP	3866	47	47	143	50	45	44
8 CSP X L. RAYTIRI	3857	46	48	155	57	45	43
1 CSP-SR BC3 F4	3833	47	48	138	50	46	45
9 TZEF-Y	3724	47	48	153	62	47	45
10 CHECK	3663	50	48	168	75	45	42
3 TZEE-Y SR BC3 F4	3381	46	47	143	56	45	43
7 TZEE-Y	3089	42	47	140	51	44	42
6 TZEE-W	3061	45	48	143	59	45	45
LSD 5%	242.1	1.7	1.9	6.0	4.0	2.0	2.1
PROB. OF F	0.000	0.157	0.184	0.000	0.000	0.021	0.001
COEFF. OF VARIATION	15.1	8.4	9.2	9.1	15.3	9.3	11.0

In general, the varieties from Pool 16 DT were earlier maturing and shorter than the other varieties. The variety BDP-SR BC3 was not only the lowest yielder but also, the latest maturing and the tallest. Maka-SR BC3 F4 was also late and tall.

Results of the combined analyses of grain yield of the extra-early varieties showed TZEE-SR BC3 F4 as the highest yielding variety and TZEE-W as the lowest yielder. The streak resistant varieties, TZEEW-SR BC3 F4 and TZEE-Y SR BC3 F4 significantly out-yielded their streak-susceptible versions TZEE-W and TZEE-Y, respectively. However, the streak resistant versions were later maturing than their streak-susceptible counterparts. In addition TZEEW-SR BC3 was the tallest entry. The later maturity and height of TZEE-W SR probably accounted for its higher yield potential compared to the other entries, especially the non-SR version, TZEE-W.

The results of the 1992 regional trials have confirmed that high yielding early and extra-early maize varieties adapted to the Sudan and Northern Guinea Savanna zones of West and Central Africa are now available. In addition, agronomic practices that are compatible with the edapho-climatic pecularieties of the zones have been developed. Some of the varieties evaluated in the regional trials have already been adopted by some national programs and are in production while others are at the on-farm testing stage. The result of the use of these early and extra-early varieties is the increase in total maize production in West and Central Africa and the movement of maize into new frontiers, especially, the Sudan Savanna. It is anticipated that national programs which have already released SAFITA-2 would replace it with a streak resistant version of Pool 16 such as Kamboinse 88 Pool 16 DT or Farako-Bâ 88 Pool 16 DT (HD). This will ensure sustained improvement in maize production and productivity and eventually, food self-sufficiency in the semi-arid zone of West and Central Africa. The high yield potential demonstrated by the extra-early varieties especially TZEE-W-SR BC3 under favorable growing conditions suggests the need for national programs to

vigorously 'push' the extra-early varieties to their farmers for use in filling the hunger gap in July in the semi-arid zone.

The next phase of the Maize Network should place more emphasis on the promotion and adoption of extra-early varieties in member countries through on-farm testing and demonstrations.

3.3. Resident Research Activities

Because of limited funding and the impact assessment study, the resident research activities were scaled down considerably. The resident research activities carried out included:

3.3.1. Development of Early Maturing Drought Tolerant Maize Varieties

One hundred and sixty half-sib families of Pool 16 DT C4 F1 were planted ear to row. Plants within families with good pollen-silk synchrony and agronomically desirable characteristics were selfed in an effort to improve the drought tolerance. In addition, the crosses between Pool 16 DT and Pool 16 Sequia, the early fractions of La Posta Sequia and Tuxpeno Sequia, were planted and selfed in an effort to introgress the superior selections into Pool 16 DT C4. The S1 families should be planted in 1993 under simulated drought conditions and plants within families with good pollen-silk synchrony should be identified and recombined to reconstitute the population.

3.3.2. Development of Extra-Early Maize Varieties

Bulked F1 seed of TZEE-WSR BC5 and TZEE-YSR BC5 were planted in half sib recombination blocks in isolation and advanced to the F2 stage. The two new varieties would be made available to NARS through Regional Uniform Variety Trials for evaluation in 1993.

3.2.3. Seed Increase and Varietal Maintenance

In order to ensure that seed for 1993 trials were available, and also to satisfy requests from national programs, multiplication of the entries in the regional trials and other varieties in the program was carried out at Kamboinse.

4.0. Provision of Financial Assistance to National Programs

Financial assistance was provided to National programs as follows:

Benin	$1500	Guinea Bissau	$1000
Cameroon	$2000	Mali	$1500
Cape Verde	$1000	Mauritania	$1000
Central Afr. Rep.	$1000	Niger	$1000
Côte d'Ivoire	$1500	Nigeria	$2000
Gambia	$1000	Senegal	$1500
Ghana	$2000	Tchad	$1000
Guinea	$1000	Togo	$1500

5.0. Publication of research results

An important activity during the year was the documentation of Network performance. A brochure summarizing the activities and achievements of the Maize Network was prepared and distributed. Also a synthesis report on the activities carried out during phases I and II of SAFGRAD to strengthen National Programs in the sub-region was edited and distributed. Lastly, a publication entitled "the performance of the early and extra-early maize varieties in West and Central Africa" was submitted for publication in the journal Discovery and Innovation.

6.0. Maize Network Impact Assessment Study

The principal activity of the Maize Network during May-December, 1992 was the impact assessment of SAFGRAD networks. The purpose was "to examine the justification for supporting regional research networks in Africa as a means of increasing (a) the efficiency and performance of national agricultural research systems in the development and adaptation of agricultural technology, and (b) the contribution of research to economic growth".

During the Maize Network Steering Committee meeting held between 19-22 May, 1992, the technical format and approaches for the impact assessment study were discussed and several suggestions were made by the Steering Committee to improve data collection and make the information to be derived from the impact assessment more useful. Following the Steering Committee meeting, the collection, analysis and synthesis of primary data by the Network Coordinators and the SAFGRAD Coordination Office from existing reports of networks, and from national programmes were carried out.

A number of meetings were held from June-July between the Network Coordinators and the Assessment Team (composed of the SAFGRAD Director of Research, USAID research analyst and a senior economist) to review the formats for the technical data collection and to address issues in the scope of work. As a result of these efforts, the technical format for data collection were prepared and sent to twelve countries, namely, Ghana, Nigeria, Niger, Gambia, Côte d'Ivoire, Cameroon, Senegal, Mali, Guinea-Conakry, Togo, Benin and Burkina Faso. It was decided by the assessment team that although the forms for technical data collection were to be sent to NARS scientists from twelve countries, the impact assessment study would cover only Burkina Faso, Cameroon, Ghana, Niger and Mali. Priority for the data collection was therefore given to these five countries. Of the

twelve countries who received the forms, only Côte d'Ivoire and Gambia did not return the completed forms.

6.1. Visits to national programs for the impact assessment

The Maize and Cowpea Network coordinators joined the SAFGRAD Impact Assessment Team (comprising Dr. T. Bezuneh, A. Schroeder and J. Scott) in their visits to Burkina Faso (6/8/92), Mali (8-13/8/92), Niger (13-19/8/92) and Ghana (20-25/8/92). The team was joined by the Sorghum Network Coordinator during the visits to Mali and Niger.

The objectives of the visits were:

a) to assist the national scientists in the completion of technical data forms sent to them earlier,

b) to gather information on the adoption and utilization of technologies emanating from the network efforts, institutional changes in NARS and any other information relevant to the Impact Assessment.

Visit to Burkina Faso

The assessment team met with the Director General for Research, the Director of INERA, and the National Leaders of the Sorghum and Cowpea Programmes on 6th August, 1992.

After brief introductory remarks by the Director General of INERA, Dr. Taye explained the objectives of the impact assessment mission. He indicated that the team was to look in more depth at the changes taking place as a result of networking activities and the impact of the technologies developed and adopted through network efforts on productivity, production and incomes. The economist, Dr. Scott added that it was necessary to determine the economic impact of SAFGRAD networks, the comparative advantage

of the SAFGRAD mandate crops (maize, cowpea and sorghum), and the effect of the adoption of the technologies on incomes. The team also emphasized the fact that the outcome of the impact assessement would determine whether investments in agricultural research is justified.

The INERA team felt that the emphasis of the assessment team should be on:

a) whether varieties are available and whether there is diffusion and adoption,

b) whether technologies have been developed and if so whether they are feasible.

They expressed concern about the assessment of the networks on the basis of the impact of technologies on incomes since they felt that several factors determine this and in most cases the researchers have no control over some of these factors. The request for information on the relative importance of the different crops was also questioned since it was considered not appropriate. It was also pointed out that SAFGRAD should not have agreed to the terms of reference for the impact assessment since the impact of research on incomes is very tricky and could even have adverse effect on research funding. They explained that it would be difficult to measure the impact of research on incomes and only indirect effect could be estimated.

The general feeling was that appropriate technologies including varieties had been developed and made available to farmers but quantitative data on adoption and the impact of technologies on incomes would not be easy to come by especially if one considered the fact that the Networks have been in existence for about five years only. However, the Director General for research promised to make available to the team documents relevant to the assessment.

On the transfer of Network leadership to NARS, the DG indicated that Burkina Faso was ready to take up the responsibility but the decision was up to SAFGRAD.

Visit to Mali

Discussions were held with the Director General of IER, Research Director and Chairman of WECASORN, Scientists at Sotuba Station, officials of the Extension services, seed multiplication agencies, World Bank Agr. Extension Project, Institute of Sahel and Ministry of Agric. Planning and the Economic Unit. A set of tables for collection of economic data was made available to the ICRISAT economist for completion.

During the meeting with the Deputy Director General of Research, he briefed the team on the institutional changes that have taken place in IER since 1990. He indicated that Agricultural research has been regionalized based on the different ecological zones in the country. Multidisciplinary teams have been established for each crop based on the importance in each zone. Each regional centre has a director and a secretary. The secretary is responsible for monitoring and evaluation. Major constraints and research needs to alleviate constraints have been identified.

The Director General indicated that although there are about 250 staff in various positions, there was still the need for training more staff and they were expecting technical assistance for this purpose. A donors conference is planned for this year to seek financial support for agricultural research. At present 40% of the agricultural research budget is borne by the government.

At the Sotuba Station, Dr. Doumbia, the cowpea entomologist, again expressed concern about the economic impact assessment of the Networks since he felt that the whole process of adoption and use of technologies depends on several factors, some of which the

researchers have very little control. Also, he felt that most of the food is produced by the subsistence farmer who is more interested in meeting his food requirements and hence yield stability is his goal rather than production for commercial purpose. The scientists expressed fear about how the data being collected by the Assessment Team would be interpreted.

At the Department of statistics, the team was informed that maize and cowpea varieties made available to Mali through the Networks have been adopted in the country. Data on these varieties were made available to the team.

During the meeting at the USAID office with Dr. Tadesse (Agronomist) and the Agricultural Development Officer, the team was again informed that maize and cowpea varieties like SAFITA-2 and SUVITA-2 and several others had been widely adopted by farmers. However, the problem is how to quantify the impact which is attributable to SAFGRAD since there are several players involved in the development and transfer of the technologies.

At CMDT it was reported that relationship had been established between cotton production and the production of associated crops like maize, cowpeas etc. Wherever improved technology is used for cotton, farmers also tend to use improved technology for the other crops. Relevant secondary data was made available to the assessment team.

Visit to Niger

The assessment team visited the Director General of INRAN, ICRISAT Sahelien Centre, the INRAN Kollo Station, the on-farm research and Extension Unit of the Ministry of Agriculture, USAID/Niger, Seed Production Unit, the World Bank and the Agricultural Statistics Unit.

During the visits the team learnt the following:

1) The agricultural research and extension are being re-organized in Niger to make them more effective. The World Bank was assisting in this endeavour and is about to start a 20 m dollar Project. The Government has no money for agricultural research.

2) The USAID has spent $41 m in 17 years on three Projects, namely cereal production, cereal research and applied agricultural research. Several staff have been trained under these projects. The basic interest of the USAID Projects has been the research and development of cowpeas, sorghum and millet. Cowpeas is presently replacing peanuts and it is an excellent fodder crop. It was pointed out that a major mistake of the projects was that the research did not get involved in animals which are very important in the farming system of Niger.

3) There is no mechanism in place in the country to document the adoption of varieties or technologies. Like in many countries, farmers are reluctant to indicate what they have done in their farms.

4) Linkage between research and extension is very weak.

5) The general impression was that developed technologies had not gone beyond the research stations and there was no impact of research on agricultural production and productivity.

6) Scientists did not have serious problems with the completion of the technical data forms sent by the coordinators.

Documents on agricultural research and extension and agricultural statistics were made available to the team.

Also, the ICRISAT economist was given a set of economic data forms for collection of relevant information for the impact assessment study.

Visit to Ghana

Places visited by the team included the CSIR Secretariat, the Extension Services Department, Crop Services Department, Sasakawa Global 2000 Project and the Nyankpala Agricultural Experiment Station.

I) CSIR Secretariat

The team was informed that the Agricultural research system in Ghana was reviewed in 1989. Based on the review a base line data is now available at the Secretariat and this is being concretized. Also restructuring of agricultural research is currently going on to make it more effective. A position has been created at the CSIR for a Deputy Director General for Agriculture to take care of Agricultural Research and to serve as the link between the CSIR and the Ministry of Agriculture. A National Agricultural Research Committee NARC, (an apex body for agricultural research) has been created to formulate policy, regulate research efforts and to control research funds. The technical secretariat of NARC is based in CSIR. The NARC is under the Agricultural Policy Coordinating Committee (APCC) and it is linked to the research institutes by the Management Boards.

About 0.05 of Agricultural Gross Domestic Product goes into research. Regional extension-research linkage committees to be chaired by the Regional Secretaries for Agriculture are to be set up under the restructuring exercise.

Relevant documents on the restructuring and review reports were made available to the impact assessment team.

II) Extension Services Department

The Director of Extension Services pointed out that even though they were aware that SAFGRAD has been active in Ghana, it was difficult to pull out exactly its contribution to maize, cowpeas and sorghum development and production. He indicated that a number of socio-economic surveys have been conducted in Ghana. The results have shown that the package of improved technology developed through the collaborative efforts of researchers and extentionists have been widely adopted by farmers. The result is an improvement in the incomes of farmers. He cited as an example of the impact of improved technology on the economy of Ghana, Mampong-Sekyedumasi area where there has been tremendous improvement in the living conditions of farmers as revealed by the improvement in their housing, the standard of living, the increase in the number of bicyles used by farmers etc. He also mentioned the exportation of maize by Ghana in 1989 and 1990 as a result of the availability of improved technology. On research-extension linkage, he indicated that strong links exist as revealed by the presence of representatives of crop services and Extension Services Department on the management boards and the sub-committees of the research institutions. Annual planning sessions are organized for maize and cowpea during which extensionists, researchers and farmers review the previous year's results and plan together the activities for the year. Some feedback on the appropriateness of technologies being promoted by the researchers and extensionists are obtained during such planning sessions. Also annual maize and legumes workshops are jointly sponsored by the Crop Services, Extension Services Departments and the crops Research Institute. The workshops serve as the forum for researchers, extensionists, policy makers and farmers to review research findings, the grower recommendations and to discuss burning issues related, to agricultural research, development and production. Research-extension linkage committees are also being established in the country. There is a training and communication unit staffed by personnel of Crops Research Institute (CRI), Extension Services Department (DCS) and Crop

Services Department (DAES). The training and communication unit is responsible for facilitating the disemination of information on maize and cowpeas as well as organizing in-service training (for extensionists) and staff of DCS. This is being achieved through the preparation of production guides for extensionists and farmers hand books. The DAES has a unit for testing of the quality of maize and cowpea varieties prior to release. Through the interaction of extensionists, farmers and researchers, the desired qualities of varieties are identified.

The Director indicated that there was a need for more research efforts in Sorghum and Millet. The MOA is currently trying to promote the production of sorghum in the arid areas in the southern Ghana where they might perform better than maize.

III) Crops Services Department

At the Crop Services Department, the Director, Dr. ofori indicated that his department serves as the link between applied and adaptive research. The department has the mandate to conduct adaptive research in conjunction with the Crops Research Institute and the extension services department. In addition, the department coordinates the breeder seed production activities of CRI, the foundation seed production by the Grains Board and the activities of certified seed growers.

Dr. Ofori pointed out that the seed inspection unit which was until recently under the DCS, has been made an autonomous body and designated as the Plant Protection and Regulatory Services. The seed inspection unit guarantees quality. The Government is expected to promulgate the National Seed Law very soon.

On seed storage, Dr. Ofori said that processing and storage facilities have been established at Ho Winneba, Kumasi and Tamale. He also indicated that the extension and crop services staff involved in seed production have been offered management training.

IV) Sasakawa Global 2000

The Acting Director of the SG 2000 Project informed the team that Ghana was selected for the Project because they realized that appropriate technology had been developed by the Crops Research Institute and the problem was how to transfer the technology. The Project was initially quite successful as farmers could obtain yields of 16-20 bags (50 kg) per acre using the improved technology compared to about 4-5 bags per acre obtainable from the traditional technology. The response from the credit institutions was also quite good and this made credit more accessible to farmers. The result was that there was surplus maize production while storage facilities were not available and the market was not ready to absorb the surplus. Consequently, farmers could not sell their produce or had to sell at prices lower than the minimum guaranteed price. The result was that farmers defaulted in the loan repayments.

Based on this experience, the Project has reviewed its activities and is currently actively involved in the storage of maize, sorghum, sesame and cowpeas and in the reorganization of the seed industry.

The Acting Director indicated that good maize, cowpea and soybean varieties are available in the country. However, there is a "vacuum" so far as sorghum is concerned.

V) NAES

The Manager of NAES, Mr. Mercer-Quarshie briefed the team on the purpose of the station, the different programmes, the personnel at post and on training and the achievements of the project.

Mr. Quarshie indicated that some few years ago maize was of little importance in Northern Ghana. In 1970, the Northern region was fourth in total National Maize Production. In 1989 Northern Regional was the first in maize production in Ghana. Cowpea production has also increased in the region. The present practice is for farmers to use the recommended improved cowpea varieties in sole crop and in rotations. Because of the earliness of the varieties released, farmers now grow two crops a year in succession. He indicated that the progress was not so good with sorghum and millet. He attributed this to the rapid turnover of staff. However, some sorghum varieties have been released and some progress is being made.

On the transfer of Network leadership to NARS, the team was informed that NARS was ready to take up this role. However, they cautioned that in order to ensure sustainability of networks there is a need for assured funding and trust by donors before the transfer of leadership to the NARS can be made. The feeling was that in Ghana, the capacity to coordinate the Networks was there. It is however necessary to get assured funding particularly from regional organizations such as ECOWAS.

On the relevance of the available technology, the team was informed that the available technologies are relevant. However, there is a need for good government policies to ensure the adoption of improved technology. For example, subsidies on inputs have been removed resulting in the doubling of the price of fertilizer. It was indicated that adoption may not be as high as expected because of Government policies with respect to credit.

On seed, the team was informed that there is a problem with distribution and marketing. Maize seed seemed to have been taken care of but there is problem with seed of other crops.

The team was informed that strong links exist between research and extension and the outfit of the Deputy Director General of Research has been charged with the responsibility for closing the gap between research and extension.

During visits to some farmers fields, the team was informed of the farmers preference for the high yielding improved maize varieties. They mentioned Okomasa, Aburotia, Kawanzie and SAFITA-2 as varieties very popular in Northern Ghana.

From the visits to the four countries, it was evident that the Networks (particularly the Maize and Cowpea Networks) have had positive impact on agricultural research as well as production and productivity of maize and cowpea in the countries visited with the exception of probably Niger.

6.2. Impact assessment review meeting

The SAFGRAD impact assessment review meeting was held from 19-20 November in Ouagadougou. During the meeting, preliminary reports on the assessment were presented by the three consultants, Dr. Taye Bezuneh, Dr. Allan Schroeder and Dr. Scott. In his presentation, Dr. Taye indicated that the assessment revealed that research process at regional level had established mechanisms for identifying constraints, research priorities and networking strategies. Also, the SAFGRAD Network model involving the NARS, OAU and the IARCs has been effective in the enhancement of national research capacity. As a result of the major role played by the NARS in the Networking, the relationship between the IARCs and the NARS has been strengthened in addition to the mutually beneficial interactions among the NARS themselves.

Dr. Schroeder indicated that the percentage of germplasm nominated by the NARS in the regional trials improved tremendously during SAFGRAD II. There was an increase in the percentage recovery rate of regional trials sent out to NARS during Phase II, indicating an improvement in the efficiency. Furthermore, sucess in the efforts to transfer improved technology to farmers increased tremendously during SAFGRAD II as well as the number of varieties released.

In his presentation, Dr. Scott made the following conclusions: "(i) Improved technologies for maize, cowpea and sorghum were reaching the producers at various rates of adoption. (ii) The relative net performance of the main commodities compared to their competitors, varied substantially from country to country. (iii) Agricultural GDP has grown moderately for all of the countries in the sub-sample, indicating that a significant portion of that growth is due to advances in production and productivity. (iv) Future agricultural research endeavours should dedicate more resources and efforts towards strengthening the crucial link between the development and adaptation of technology at the level of the research station and its adoption at the level of the producer."

Finally, the SAFGRAD Network Coordinators made presentations on the technologies in the pipeline at the end of Phase II.

The Maize Network Coordinator presented a list of maize technologies in the pipeline (Tables 6 and 7). He informed the meeting that the Network is actively working on the following:

- Breeding for *Striga* tolerant varieties.
- Breeding for early, drought tolerant varieties.
- Promoting the adoption of technologies made available by the Network.

Table 6. Promising Network technologies in the pipeline

1. Extra-early varieties

(Across 8131 x JFS) x Local Raytiri
CSP
CSP-SR
CSP x Local Raytiri
Pool 27 x Gua 314
Pool 28 x Gua 314
Pool 30 x Gua 314
TZEE-W1
TZEE-W2
TZEE-Y
TZEE-Yellow Pool
TZEE-YSR
TZEEF-Y

2. Early varieties

Across 90 Pool 16 DT
Farako-Bâ 90 Pool 16 DT
Ina 90 Pool 16 DT
Kamboinse 90 Pool 16 DT
Maroua 90 Pool 16 DT
Nyankpala 90 Pool 16 DT
Maka SR.

3. Improved agronomic practices

a. Tied ridges for soil moisture conservation in Sudan Savanna.

b. Better seed treatment chemicals for improved plant establishment and grain yield.

c. Increased plant population for higher grain yield of early and extra-early varieties.

d. Earlier date of fertilizer application (top dressing) for increased yield of early and extra-early varieties.

Table 7. Promising maize varieties in the pipeline for release in West and Central Africa countries.

Country/Name of variety	Origin	Adaption Area
BENIN		
DMR-ESRW	IITA	North
Pool 16 DR	SAFGRAD	North
EV 8328-SR	CIMMYT-IITA	North
BURKINA FASO		
FBC 6	INERA (Burkina)	
KPB		
KPJ		
KEB		
KEJ		
Pool 16 DR		
CAPE VERDE		
Maka	Mauritania/SAFGRAD	
CENT. AFR. REPUBLIC		
CMS 8501	Cameroon	
CMS 8710	Cameroon	
CHAD		
Pool 16 DR	SAFGRAD	Sudan Savanna
CMS 8602	Cameroon	Sudan Savanna
CSP X L. Raytiri F3	SAFGRAD	Sahel
COTE D'IVOIRE		
Maka	Mauritania/SAFGRAD	Center
Pool 16 DR	SAFGRAD	Center
TZEF-Y	SAFGRAD	Center
Ferke 8336	CIMMYT	North
GHANA		
Dorke SR (Pool 16-SR)	CIMMYT-IITA	Country-wide
GH 8363-SR (QPM)	CIMMYT-IITA	Country-wide

Table 7. (Cont'd)

Country/Name of variety	Origin	Adaption Area
GUINEA		
Ikenne 83 TZSR-Y-1	IITA	
EV 8428-SR	CIMMYT-IITA	
IRAT 200	IRAT/CI	
IRAT 292	IRAT/CI	
Poza Rica 8526	CIMMYT	
MALI		
DMR-ESRY	IITA/SAFGRAD	
TZEF-Y	SAFGRAD	
Los Banos 8531	CIMMYT	
Across 8464	CIMMYT	
MAURITANIA		
Gwebi 8422	CIMMYT	
Pool 16 DR	SAFGRAD	
CsP Early	CIMMYT/SAFGRAD	
NIGER		
Composite Kollo 1	Niger	South (Rain-fed)
NIGERIA		
White Composite	IAR & T	
SENEGAL		
Sids 8445	CIMMYT	
Ikenne(1) 8149-SR	CIMMYT-IITA	
TOGO		
AB 11	Togo	
AB 12	Togo	
1B 13	Togo	

He reported that materials with moderate resistance to *Striga hermonthica* have been identified and that an effective screening method had been developed by IITA. Ghana and Cameroon national programmes are working on the development of new *Striga* tolerant varieties. In addition, work is in progress to develop cultural practices for *Striga* control as well as biological control of *Striga*.

The Network Coordinator indicated that work in the above areas would be consolidated, provided financial support to SAFGRAD was assured. He emphasized the fact that SAFGRAD had continued to be the only organization that has focused research on the development of maize technology for Sudan and Sudano-Sahelian zones. The Network has been actively developing varieties that combine early maturity (90-95 days) with drought tolerance and reasonably good yields since 1984. Some of such varieties have been made available to national programmes. However, there is need to incorporate higher levels of tolerance and adaptation to drought stress in the released varieties so as to make them more attractive to farmers.

In order to promote the adoption of technologies made available by the Network, the following activities were proposed for the Maize Network:

- Research for improved cultural practices for early and extra-early varieties;
- Influencing of government agricultural policies.

Before the review meeting came to a close, the USAID/Washington, officials confirmed that the SAFGRAD Phase II would terminate on 31st December, 1992. However, USAID was still interested in supporting networks in Africa. It was indicated that USAID was willing to consider a joint proposal for funds for network support from the IARCs and OAU. Furthermore, USAID was prepared to consider a request for an extension of SAFGRAD II at no extra cost in order to allow enough time for the preparation and submission of Project proposals by the different networks.

1992-04

1992 ANNUAL REPORT, WEST AND CENTRAL AFRICA COLLABORATIVE MAIZE RESEARCH NETWORK

AU-SAFGRAD

AU-SAFGRAD