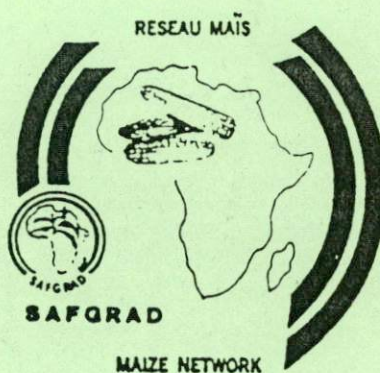


ORGANIZATION OF AFRICAN UNITY  
SCIENTIFIC, TECHNICAL AND RESEARCH COMMISSION  
(OAU/STRC)

**WEST AND CENTRAL AFRICA COLLABORATIVE  
MAIZE RESEARCH NETWORK**

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WEC



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1991/92 CROP SEASON MID-YEAR REPORT

(APRIL - SEPTEMBER, 1991)

OF THE NETWORK COORDINATOR

TO THE

10TH STEERING COMMITTEE MEETING

OUAGADOUGOU, BURKINA FASO

11-14 NOVEMBER, 1991

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## I. INTRODUCTION

The Inter-Network Conference/Workshop held in Niamey, March 8-14, 1991 provided scientists from the 17 countries composing the Maize Network a forum to review progress and reappraise strategies. The Steering Committee membership was reconstituted and Working Groups were established.

The Project which was scheduled to end 31 August 1991 was extended to 31 December 1991 to allow full utilization of the cropping season. During the period under review (April-September 1991), USAID, the Donor, commissioned a Final Evaluation of the SAFGRAD Project. The report of the Evaluation Panel "underscored the contribution of SAFGRAD II to the advancement of African scientific leadership and research professionalism in the agricultural sciences". It therefore recommended that "AID and other donors and agencies should make at least a 10-year commitment of financial and technical assistance to the SAFGRAD networks...".

This report summarizes the activities of the Maize Network during the period 1st April to 30 September 1991.

## 2. REGIONAL TRIALS

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At the Niamey Workshop, the assembly of National Scientists agreed to continue with the two types of regional maize trials hitherto organized and co-ordinated by the Network. Entries were discussed for the reconstitution of the trials.

### RUVT-Early

The trial comprises 14 varieties. Nine of them are white including one with soft endosperm (TZESR-WSE), four are yellow, and one check entry to be supplied by the trial collaborator. Four of the varieties are different from those in the 1990 trial; two of these are improved locals which were converted to streak



resistant (Blanc 2 Précoce-SR and Maka-SR) through network activities with the backstopping of IITA.

### **RUVT Extra-Early**

For the first time, extra-early varieties that are streak resistant were available for evaluation. Four varieties had been converted by the Network to streak resistant (BC3 F3). They were included with their non-streak resistant counterparts in order to obtain additional information on the progress made on improving the genetic background of these varieties. The trials has 9 varieties and one check entry. The introgression of streak resistance genes would allow maximum exploitation of these varieties ; for instance, the urban farmers, who are rapidly increasing in number, can conveniently raise 5 crops for green maize in 1 year :

Fourty-four and 38 trials sets were requested for RUVT-Early and RUVT-Extra-Early, respectively by 18 countries in West and Central Africa and one country from Southern Africa (Table 1). This includes special requests from Sierra Leone and Malawi which have not been traditional members of the Network.

Weather conditions were generally satisfactory in the region in the 1991 cropping season. Rainfall started very early. This prompted earlier than usual plantings some of which failed. There was increased weed infestation. In Burkina Faso, the Sudan Savanna and the Sahel received more rains than usual. For instance, total rainfall in Kamboinse was 1022 mm in 61 days compared to 596 mm in 45 days for 1990 and all-time average of 800 mm. Apart from a 10-14 day dry spell in the first half of September, rainfall distribution was satisfactory and even enough to successfully grow late maturing varieties in the Sudan savanna. Although there was scattered incidence of streak virus, disease problems were not significant. The only serious insect pests were termites and the cantharides, the latter destroyed tassels/pollen. Rainfall was, however extremely deficient in



Mauritania; no location received up to 100 mm throughout the growing season.

### 3. COLLABORATIVE RESEARCH

The Network Coordinator carried out the following activities to support the collaborative research efforts of the Network.

#### 3.1. Development of early maturing, drought tolerant germplasm

*3.1.1. Formation of experimental varieties from 1990 Pool 16 DR Progeny Trials.* In the 1990 cropping season, 165 full sibs from Pool 16 DR Cycle 3 plus 4 checks were evaluated in a 13 x 13 lattice design of 3 replications at five locations in 4 countries viz : Benin (Ina), Burkina Faso (Farako-Bâ, Kamboinsé), Cameroon (Maroua) and Ghana (Nyankpala). The best 10 families at each location were identified and these were recombined in 1991 at Kamboinse using stock seed of these families.

*3.1.2. Advancement of Pool 16 DR to Cycle 4 and further introgression.* Based on the performance of the 165 full sib families across all the test locations, the best performing 52 families were recombined in 1991. Selection was based on the following criteria : performance under stress (drought/high plant population), resistance to foliar diseases, plant standability, tight husk cover, grain character and yield.

In order to widen the base of the population, bulk pollen from the 52 families was used to pollinate Pool 16 Sequia, an introduction from CIMMYT. This latter germplasm has the tendency of producing silk ahead of anthesis. This is one of the traits that correlate with drought tolerance/resistance. Similarly, crosses were made with the early fractions of La Posta Sequia and Tuxpeno Sequia.



Table 1. Dispatch of 1991 Regional Maize Trials to  
SAFGRAD member-Countries.

Country	RUVT-Early	RUVT Extra-Early	Total
Benin	3	2	5
burkina Faso	4	4	8
Cameroon	3	3	6
Cape Verde	1	0	1
Central Afr. Rep.	2	2	4
Côte d'Ivoire	5	2	7
Gambia	2	2	4
Ghana	3	3	6
Guinea	2	1	3
Guinea Bissau	2	2	4
*Malawi	1	1	2
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	44	38	82

\*These are special requestes by countries which  
have not been traditional members of the SAFGRAD  
Maize Network.



3.1.3. *Cycle comparison of Pool 16 DR.* Cycles 0, 1, 2 and 3 of Pool 16 DR and the experimental varieties generated from cycles 1 and 2 were evaluated under drought or high population density stress at 3 locations in Burkina Faso : Kamboinse and Saria (drought stress) and Farako-Bâ (high plant population). At Kamboinse and Saria, 2 levels of soil moisture were simulated by sowing in tied vs untied ridges using normal plant density (66,666 plants/ha). All plantings were on flat at Farako-Bâ but there were two levels of plant density : normal (66,666 plants/ha) and double density (133,333 plants/ha). Plant establishment was excellent at all the locations. Although there was the expected trend of reduced plant growth and performance under untied versus tied ridges, the differences were not very large because of the heavy and better spread of rains this year in the Sudan savanna.

## 3.2. Development of extra-early maize

### 3.2.1. *Improvement of TZEE-WSR and TZEE-YSR*

TZEE-WSR BC3 F3 and TZEE-YSR BC3 F3 were planted in isolation blocks for half-sib improvement. Within each population, late-flowering plants and those with other undesirable characteristics were detasseled in the male rows. At harvest, ears with poor tip cover were rejected. The populations were also advanced to Backcross 4 F1 generation.

3.2.2. *Improvement of CSP-SR.* CSP-SR BC3 F3 was planted for improvement and seed increase under controlled pollination (bulk sibbing). Selection was made against late-flowering plants and other undesirable characters. Ears with poor husk cover were eliminated. It was also advanced to BC4 F1.

3.2.3. *Improvement of DR Comp. Early.* DR Comp. Early is a mixed grain type composite synthesized from 8 improved and local varieties previously identified promising under drought stress. When it was included in the 1989 and 1990 RUVT-Early trials, DR Comp. Early demonstrated high yield potential but it needs to be improved for good husk cover. The germplasm is earlier than the



other entries in the Early variety trial. It has been separated into white and yellow grain types and two cycles of recombination carried out within each group. In the 1991 cropping seasons, they were crossed with appropriate sources of streak resistance (EV 8730-SR, EV 8731-SR).

### 3.3. Miscellaneous nursery

Twenty downy mildew resistant (DMR) acquisitions from CIMMYT Thailand Program were planted at Farako-Bâ and Kamboinse for observations on foliar diseases, and for seed increase respectively. They consist of 9 white, 10 yellow and 1 cream cultivars belonging to dent, flint and semi-dent endosperm types. They range from early to late in maturity.

DMR-ESRW and DMR-ESRY were crossed with accessions in compatible colour groups. This will serve to widen the DMR base of these varieties which are released or in on-farm stage in many countries in West and Central Africa.

### 3.4. Seed Increases

Seed increases were made for over 100 varieties, populations and accessions ; practically all by controlled hand pollination. They are current or old trial entries. For most of them quantity produced ranged from 5 to over 50 kg per entry.

## 4. FINANCIAL ASSISTANCE TO NATIONAL PROGRAMS

Financial assistance (\$1000-2000 per country) was given to the Network member countries in 1991. The disbursement of the first instalment is shown in Table 2.



Table 2. Disbursement of funds to National Maize  
Programs for 1991 Crop Season (1st instalment)

Country	Amount (\$ equivalent)
Benin	1000
Burkina Faso	1000
Cameroon	1000
Cape Verde	500
Côte d'Ivoire	1000
Gambia	500
Ghana	1000
Guinea Conakry	1000
Mali	2000
Mauritania	500
Niger	500
Nigeria	1000
Senegal	1000
Tchad	500
Togo	1000



## 5. VISITS TO NATIONAL PROGRAMS

To monitor research activities in Network-member countries and to foster scientific exchanges among scientists in the Network, the Maize Network sponsored the visits of two Steering Committee members to other countries. Dr. Charles Thé of Cameroon visited the Ghana Maize Program (28 July-4 August 1991) and Mr. Abdou Ndiaye of Senegal visited the Mali Maize Program (August 1991). Both of them will present the reports of their visits during the 10th Steering Committee meeting.

The Maize Network Coordinator, Dr. J.M. Fajemisin, visited Mauritania to get acquainted with maize research and related activities in that country. The major findings are :

- (i) Less than 1% of the land area in Mauritania is arable and although long term annual average rainfall for this arable portion is 200-400 mm, no area in the country received up to 100 mm in the 1991 rainfed cropping season.
- (ii) In spite of serious limitation in natural resources, Mauritania is making intense efforts to exploit research findings for increased food production.
- (iii) Although manpower shortage is apparent, the country has participated continuously in SAFGRAD-sponsored activities.
- (iv) The Government has encouraged research by providing funds and political support. It has supported and demanded progress from its peasant-oriented irrigation schemes.



- (v) The parastatal project managing the irrigation schemes puts continuous pressure on research to provide new and productive technologies that would allow an intensive utilization of the irrigated plot for profitable grain production (maize and rice rotation in rainfed and irrigated seasons).
- (vi) There is need to assist Mauritania in its efforts to identify technological innovations by offering a place in our technician training program.

Although a visit of the Coordinator was planned for Cape Verde and all arrangements completed, it was unfortunately not possible to effect the trip as a result a last minute message received as to the inavailability of the contact person in Cape Verde, Mr. Carlos Silva.

## 6. TRAINING

In complying with the decision of the 9th Steering Committee meeting, a training was held at IITA July 15-20, 1991 on the use of MSTAT Computer for data analysis. It was organized jointly by the SAFGRAD Maize and Cowpea Networks and IITA's Maize and Grain Legume Improvement Programs. The Maize Network sponsored the participation of scientists from six countries : Benin, Burkina Faso, Cameroon, Ghana, Mali and Togo.

## 7. BACKSTOPPING

Further to assisting with the Computer training, IITA provided backstopping to the Network by responding to the needs of national maize programs of several Network member-countries for seed of improved germplasm in terms of trials and specific requests for crop improvement projects. IITA also contributed materials and expertise towards the installation of streak screening facilities at Fumesua, near Kumasi for the Ghana



National Maize Program. It is relevant to mention that the Network assisted in this venture by allocating in 1990 the sum of \$3000. The facilities are now operational.

The IITA Maize Entomologist, Dr. N.A. Bosque-Perez, in the company of the national entomologist Mr. Seydou Traore, carried out a survey of Burkina Faso in September 1991 to determine if the dreaded pest, the larger grain borer (*Prostephanus truncatus*) was present in the country. This was prompted by the fact that this pest has been reported in the neighboring countries of Togo and Ghana. Samples collected through the use of the Pheromone trap technique was confirmed by the International Institute of Entomology in London as *Prostephanus truncatus*. The relevant Burkinabe Government authorities are being informed of this sad but inevitable development and the need to take both short and long-term measures to reduce its decimating effect.

## 8. FINAL EVALUATION OF SAFGRAD II

The USAID-sponsored End-of Project Evaluation of SAFGRAD II took place April-June, 1991. The purpose of the evaluation was "to examine how and to what extent the support of the SAFGRAD II Project for four Collaborative Agricultural Research Networks for Food Crops and for the OAU/STRC SAFGRAD Coordination Office contributed to the increased efficiency and effectiveness of agricultural research and production techniques for sorghum, millet, maize, and cowpeas in semi-arid Africa".

The 3-man team, which comprised an agricultural research policy specialist, an agricultural research management specialist and a plant breeder/agronomist, reviewed relevant project documentations (including reports of Steering and Oversight Committee meetings, workshop proceedings, monitoring tour reports) and held series of interviews with the Network Coordinators and the SCO management. The team also visited selected participating member-countries, IITA (Ibadan) and



ICRISAT (Niamey) to hold discussions with research administrators and scientists.

Based on a critical assessment of the information obtained, "... the principal finding is that the project has been successful as designed. The project fully achieved most of the planned outputs and the expected End-of-Project conditions as identified in the Project Paper Revised Logical Framework".

The evaluation Panel observed that "SAFGRAD II clearly demonstrates the short-term and readily identifiable payoffs in regional research networking to the performance in the dissemination and use of improved technologies in semi-arid Africa. The long-term reward of such investments will be found in the less easily perceived, but slow and steady professional growth and development of national agricultural research scientists". The report therefore concluded that "the principal recommendation emerging from this evaluation is that AID and other donors and agencies should make at least a 10-year commitment of financial and technical assistance to the SAFGRAD networks, including continued support for an office to assure essential network scientific direction and secretarial support".

The observations and recommendations made by the Evaluation Panel will be appraised at the 10th Steering Committee meeting of the Maize Network. Meanwhile, in reaction to the positive recommendations of the team, a proposal has been forwarded to USAID for a 12-18 month extension of SAFGRAD II as a transitional step towards a likely SAFGRAD III.

## 10. PLANNED ACTIVITIES

The proposed SAFGRAD II extension envisages carrying out of a regional technology impact study which will serve as a test model for developing an analytical mechanism to evaluate agricultural research. There will also be a continuation of a minimum Network Program activities during the extension period.



Planned activities in the second half of the year will comprise:

1. Analysis and collation of 1991 regional trial results
2. Facilitation of the technology impact study
3. Implementation of the minimum Network Program activities as determined by budget allocation

## **9. MISCELLANEOUS**

### **9.1. Proceedings of 1991 SAFGRAD Inter-Network Conference**

The Proceedings of the SAFGRAD Inter-Network Conference held 8-14 March 1991 at Niamey, Niger are being processed in two forms. The editing of the scientific papers is being coordinated by Consultants employed by the SAFGRAD Coordination Office. The country reports are being processed by the Network Coordinator.



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