



Intsormil

TRIP REPORT

BAMAKO, MALI
MARCH 17-26, 1982

by

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and
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☆ International
Sorghum/Millet

☆ Collaborative Research
Support Program
(CRSP)

A Research Development Program of the Agency for International Development, Participating Land-Grant Universities, Host County Research Agencies and Private Donors.



Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln



Purposes: To participate in exchange visits of the IER soil lab director and a team of INTSORMIL soil chemist and physicist to study and adopt analytical methodologies and to determine necessary equipment for the IER soils lab as specified in the program for year 1 in the Memorandum of Agreement between IER and INTSORMIL.

To visit the FAO in Rome and obtain information on procedures for soil physical and chemical measurements in tropical soils and any related data relative to plant responses.

<u>DATE</u>	<u>ACTIVITY</u>
Wednesday MAR 17 am	Departed Lubbock, Texas for Bamako, Mali.
Thursday MAR 18 pm	Arrived Bamako, Mali. Informed of the need for a soil-plant water program with ICRISAT in Niger.
Friday MAR 19 am	Met for breakfast with Dr. Oumar Niangado, Kanate Mama, Mamadou Simpara and Adama Coulibaly.* Also present were Phil Serafeni, Drs. Calhoun, Onken and Wendt. The discussions were concerned with becoming acquainted and with production problems in Mali. Following the breakfast meeting, Drs. Calhoun, Onken, and Wendt met with Bob Shoemaker and Steve Dawes to discuss the purpose of the visit of the team from TAMU. The team also met briefly with Dianne McClean. At 10:00 a.m. Drs. Calhoun, Onken, Wendt, Niangado, and Mr. Simpara and Mr. Serafeni, met with Dr. Zana Sanogo. An overview of the IER-Title XII INTSORMIL collaborative program, to date, was presented including the status of the agreements and work plans to date, Dr. Rosenow's and Dr. Neild's visit and the collaborative research with ICRISAT. Dr. Sanogo replied that he was pleased with the progress on the memorandum to date and cautioned that correspondence to scientists in IER should be addressed to him to the attention of the particular scientists involved. He was concerned about training scholarships for Malian students and expansion of the laboratory and was glad that someone from the United States was staying for the conference of Agronomic researchers in Mali. The TAMU scientists indicated that expansion of the laboratory would depend on the type of collaborative research.

*Positions of personnel mentioned in this report are listed on pages 6 and 7 of this report.

Development of further agreements between IER, INTSORMIL and TROPSOILS, Dr. Sanogo said that a formal agreement was needed between IER and the Title XII (INTSORMIL and TROPSOILS) programs. He suggested an agreement be designed which includes both programs. The TAMU scientists pointed out that they were not at liberty to negotiate agreements since it was the responsibility of management entities (ME). Other suggestions concerning agreements included:

1. Dr. Niangado to bring the IFDC agreement to the United States for evaluation as a model for a potential agreement.
2. The next agreement should be more specific.
3. The next agreement should be cleared with the ME's in the United States and telexed to AID, to the attention of the Director Général of IER for his approval before it is finalized.

The visit with Diane McClean was continued. The research by the team from the Netherlands was discussed. She furnished a copy of a paper entitled "Crust formation on sandy soils in the Sahel and its effect on the infiltration rate" by W. B. Hoogmoed and L. Stroosnijder. She requested that I go to the Netherlands and visit Dr. Leo Stroosnijder as he would be interested in the findings and plans of the TAMU team. The remainder of the afternoon was spent changing travel plans and making arrangements to go to Wageningen to visit with Dr. Stroosnijder.

Saturday
MAR 20 am

Procedures used to measure physical parameters at the Sotuba soils laboratory under the direction of Mamadou Keita, principal engineer, were reviewed by Drs. Wendt, Onken and Calhoun. Findings and recommendations from the review are in the report on the laboratory.

The TAMU team met with Bassarou Keita to discuss mapping of of the new station at Cinzana. The team also met with Dr. Oumar Niangado, Mamdou Simpara, Adama Coulibaly and Phil Serafeni to discuss soil-plant-water research needs in Mali. There was a consensus among the group that data on the water balance in Mali is needed prior to making major modifications to the system. Millet is grown on the sandy soils of the sandy uplands while grain sorghum is grown in the lowlands where surface flooding occurs. The surface soils become somewhat hydromorphic due to the intense rains and drying. Consequently, runoff is high. Supplemental irrigation may be possible in some areas. The country needs assistance in water conservation technology transfer to increase productivity.

Sunday
MAR 21 am

During the morning, Dr. Calhoun and I discussed the Soil-Plant-Water Research requested by ICRISAT. An overview of Dr. Calhoun's trip to date as it related to the request was presented. From the discussions, it was apparent that there are different concepts as to what the major problems are. For instance, some say that crusting is a major problem while others say that crusting is minor and the compaction and cementing associated with intense rains and drying is the major problem. These different concepts probably exist due to differences in soils and emphasize the fact that soil-plant-water management problems are rather site specific.

Monday
MAR 22 am

The early part of the morning was spent making a general project proposal for the TAMU TROPSOILS soil-plant-water research program to be headquartered at the ICRISAT Sahelian Center near Niamey, Niger. Later in the day, discussions were continued with Mamadou Simpara and Adama Coulibaly concerning water research needs in Mali. Mamadou and Adama both felt that they were capable of conducting water research with some guidance and consulting. For the future development of such programs in Mali, the fact that they have such confidence and ambition is good. Neutron probe data collected under the guidance of Mike O'Neal from Arizona was reviewed. The data indicate that measurements should be obtained at deeper depths (3 meters) to obtain necessary information on soil water extraction patterns.

During the afternoon the TAMU team met with John Scheuring and Phil Serafeni and discussed findings made during the visit.

In the evening, the same group plus Dr. Claude Charreau, met for dinner. Dr. Charreau extended an invitation to attend an ICRISAT-IRAT conference on soil-water-plant relationship and soil water management to be held in Montpellier, France, May 3-5, 1982. At midnight, Dr. Onken and I departed for Paris.

Tuesday
MAR 23

Spent day in Paris after missing plane to Amsterdam. Traveled to Rome in the evening. The reservation at the Excelsior was not available so I stayed at Majestic. There was a message to call Mr. Furman at the American Embassy.

Wednesday
MAR 24

Called the American Embassy, and Mr. Furman was ill. However, his secretary was most helpful in getting plane tickets changed, currency, appointments with people at the FAO, cheaper hotel rate, and telephoning Dr. Stroosnijder in the Netherlands.

Dr. Rudi Dudal made an appointment for me with Dr. A. G. Pecrot and G. M. Higgins. We discussed the various Title XII programs (INTSORMIL and TROPSOILS) in which TAMU teams are involved. They were very supportive in their comments. Based on their experience and information, the arid and semi-arid areas of Africa (1.4 billion acres) are currently overpopulated based on the food resources available which are diminishing as population increases. Over 100,000,000 people are currently located in these areas. Irrigation could increase productivity in parts of the area. However, the cost to import the technology and train the people would be \$10,000/acre or \$25,000/hectare. It is doubtful if the industrialized nations can afford the loans or the investment. There was a strong feeling that the current system of food production can be improved by introducing improvements through the tribal system.

The multiple cropping system currently used offers advantages because it affords some insurance against risks. Some crops must be produced every year in order to prevent starvation. Both of them emphasized that the existing system has evolved over time and is doing quite well considering the resources available. Rather than to introduce new systems of production, faster improvements would be made by modifying the existing systems.

Both scientists gave me pertinent publications and access to their libraries. Additionally, they gave me a list of people with experience in West Africa.

After the visit, I went to the publications store of FAO. Some excellent publications were available on procedures for chemical and physical measurements in tropical soils. However, most of them were in French. I was advised to order the publications in English from UNIPUB.

Thursday
MAR 25

Enroute from Italy to the Netherlands by air. Traveled from Amsterdam to Wageningen by bus and train. I met with Dr. Leo Stroosnijder concerning the research conducted during the past five years in Mali. The team from the Netherlands consisted of a plant physiologist, soil micrologist, soil scientist, and an ecologist. One of the first concerns expressed by Dr. Stroosnijder was the laboratory situation in Mali. The plant laboratory which is under a separate ministry from the soils laboratory, is under the direction of Dr. Diallo.

It is a fairly high quality laboratory but received few samples, while the soils laboratory receives a large number of samples. In the past, there have been problems with undependable water and electricity supplies and a turnover in qualified

personnel. At one time, there was no water for six months. There are some problems of having two laboratories with similar interests under two different ministries.

One of the major problems in Mali is that there is no general plan for the field of soils and requirements for the disciplines and training required. For instance, the current mapping program is excellent (even though it should include Malian trainees) but there are no trained Malian soil scientists to use the maps. The Netherlands program was carried out for five years with four scientists and four counterparts. After completion of the project, the counterparts went back to the departments since they did not have funding to use their skills.

Even though the Dutch program is over, they are continuing through short courses to train the people. They offer a 3-week short course (2 weeks theory and 1 week case history) to Malians in French.

The Dutch have turned in a proposal to their government to continue soil-plant-water used and soil management research in West Africa.

Some comments on research findings -- Under range conditions, nutrients, especially phosphorus, may be more limiting to forage production than water. However, in millet production, water is usually more limiting than nutrients. To start a millet crop, 40 mm of rainfall are required.

The Dutch are cooperating with developing countries to evaluate the validity of analyses for certain elements.

PERSONNEL

Dr. Frank G. Calhoun	Professor of Tropical Soils Texas A&M University
Dr. Claude Charreau	Research Coordinator, IRAT, France
Mr. Adama Coulibaly	Agronomist, IER, Mali (Trained at California Polytechnic Institute)
Mr. Steve Dawes	Chief of Remote Sensing (AID), Mali
Dr. Rudi Dudal	Head, Land and Water Development Division FAO, Rome
Mr. Allan R. Furman	Attache for development Affairs, American Embassy, Rome
Mr. G. M. Higgins	Coordinator-Agroecological Zones Project Soil Resources, Management and Conservation Service, Land and Water Development Division FAO, Rome.
Dr. W. B. Hoogmoed	Agricultural Engineer Agricultural University, Wageningen, The Netherlands
Mr. Bassarou Keita	Pedologist and Head of Soils (IER), Mali
Mr. Mamadou Keita	Director of Soils Laboratory, (IER), Mali
Ms. Dianne McClean	Project Manager, USAID, Mali
Mr. Kanate Mama	Agrometeorologist, IER, Mali
Dr. R. E. Neild	Agroclimatologist University of Nebraska
Dr. Oumar Niangado	Plant Breeder, IER, Mali (Trained in France)
Dr. Arthur B. Onken	Professor of Soil Chemistry & Fertility, Texas Agricultural Experiment Station
Dr. Darrell Rosenow	Plant Breeding (Sorghum) Texas Agricultural Experiment Station
Dr. Zana Sanogo	Director of Agronomic Research (IER), Mali
Dr. John Scheuring	Cereal Breeder, ICRISAT, Mali
Mr. Phil Serafeni	Agronomist and Team Leader, ICRISAT, Mali

Mr. Bob Shoemaker	Chief of Planning and Research (AID), Mali
Mr. Mamadou Simpara	Agronomist, IER, Mali (Trained in France)
Dr. Ir. Leo Stroosnijder	Soil Physics, Agricultural University, Wageningen, The Netherlands
Dr. Charles W. Wendt	Professor of Soil Physics Texas Agricultural Experiment Station