

Report on Trip to Mali
July 7 - 28, 2001
USAID Grant No. LAG-G-00-97-00002-00
SM-CRSP Project *Decision Aids for Integrated Nutrient Management*

Travelers:

Frank M. Hons - Texas A&M University
Frank J. Smith - North Carolina State University

Objectives:

Primary objectives of this travel were to: 1) collect all project reports and data pertaining to the millet/cowpea core study, the Ca and Mg movement study, and composting with local rock phosphate, 2) assist with interpretation of data, and 3) collect additional information from farmers around the Segou region to assess on-farm impacts of the SM-CRSP project.

Itinerary:

- July 7-9 Travel to Bamako
- July 10 Discussions with Dr. Mamadou Doumbia, Mr. Adama Coulibaly and Mr. Oumar Coulibaly in Bamako at IER's Sotuba Station
- July 11 Travel to Segou with Dr. Abou Berthe, head of Inter-CRSP Farming Systems Project; visited with farmers in Dougouba village participating in on-farm trails relating to NuMaSS, compost placement, etc. or farmers interested in participating
- July 12 Traveled to IER's Cinzana Research Station; met with personnel at the Station and eight farmers from surrounding villages.
- July 13 Return Sotuba Station; discussions with Mamadou Doumbia, Abou Berthe, Adama Coulibaly, Oumar Coulibaly and others; Frank Hons departs for U.S.
- July 14 Meetings with Mamadou Doumbia and Russ Yost to coordinate activities
- July 15 F. Smith and Abou Berthe designed the survey instrument and detailed procedures of survey implementation.
- July 16 F. Smith reviewed documents with Mamadou Doumbia, produced digitized map of the Segou region and gathered additional information for the evaluation report.
- July 17-23 F. Smith undertakes activities in Ghana unrelated to the SM-CRSP; no claim for time and expenses to the SM-CRSP project
- July 24 Meetings by F. Smith in Bamako with Mamadou Doumbia, Abou Berthe and Oumar Coulibaly to review progress on survey plans and preparations.

July 25 Meetings with Mamadou Doumbia, Abou Berthe and Russ Yost; meetings with USAID Chief Agricultural Officer, Roger Bloom; meeting with the Dean of the Faculte des Sciences Juridiques et Economiques, Universite du Mali

July 26 F. Smith departs for U.S.

Report:

The first day in Bomako was spent reviewing the activities of Dr. Mamadou Doumbia and his associates who are conducting the core experiment, the Ca and Mg movement study, and numerous on-station and on-farm trails relating to NuMaSS validation, composting with rock phosphate, placement of compost and fertilizer, and other studies related to SM-CRSP. NuMaSS fertilizer predictions are being compared with Mali's standard fertilizer recommendation and the Dutch Quadrant method on fourteen farms (7 near Cinzana and 7 near Dougouba) plus the Cinzana Research Station trials. Thirty additional on-farm trails associated with composting, placement, etc. are also being conducted in these areas.

Additional NuMaSS trials with sorghum, corn, millet, and peanut are also being conducted at the Sotuba Center along with eight additional studies related to SM-CRSP. The Malian standard recommendation is based upon long-term fertilization studies and results in a single crop-specific recommendation across an entire region. It does not take into account soil properties or soil test results for specific fields. The Dutch Quadrant method is based on a graphical analysis of crop response to fertilization (van Keulen, 1982, Graphical analysis of annual crop response to fertilizer application, *Agric. Syst.* 9:113-126) and was later modified by van Duivenbooden et al. (1996, Nitrogen, phosphorus, and potassium relations in five major cereals reviewed in respect to fertilizer recommendations using simulation modeling, *Fert. Res.* 44:37-49). This method predicts fertilization requirements for N, P, and K based on yield goal, expected nutrient export based on crop and yield, and assumed nutrient recovery percentages. NuMaSS fertilization predictions are based on soil characteristics measured at each trial and a model, which does account for the same parameters used in the Dutch method plus additional factors. Initial analysis of results from previous years implied that the Malian recommendation would be more economical for millet and sorghum in drier areas, whereas the Dutch and NuMaSS approaches might be more useful with higher value crops, such as rice, corn and ,possibly, cotton in higher rainfall areas.

Dr. Doumbia also provided a list of 19 Master of Science students from Katibougou University that he has worked with under the auspices of SM-CRSP on issues related to NuMass and the SM-CRSP. A computerized database that contains the abstract, major conclusions, and data from each of the theses is currently being developed.

Possible follow-up questions to a baseline survey of farmers in the Segou area in 1998 were discussed by Smith, Doumbia, Oumar Coulibaly, and Hons. This survey would help quantify the impacts of the SM-CRSP project on local farmers. The survey instrument was finalized following Dr. Smith's return from Ghana and the survey should be taken by the end of August 2001. A separate detailed report will be forthcoming once the survey data is analyzed and interpreted.

We held an informal meeting with farmers near the Dougouba Village during their market day. This village had been isolated and only started market days after beginning cooperation with the SM-CRSP project. Farmers participating in the discussion included both ones actively involved in NuMaSS and other on-farm trials and those not currently participating. With questions developed cooperatively with Abou Berthe, Doumbia, Smith, and Hons, Dr. Berthe informally interviewed the farmers concerning the perceived benefits of the project to them and if it had changed their awareness of the soil resource and soil fertility. All agreed that composting with rock phosphate (RP) increased economic yield compared to compost alone and that they would purchase the RP for the process. When questioned about a source and cost of RP, however, these farmers which until recently had been isolated did not have answers. Even farmers not currently participating in on-farm trials were interested in future participation.

We met with Dr. Samba Traore, millet agronomist at the Cinzana Research Station and head of millet production research for Mali, and discussed his research that had common interests with the SM-CRSP project. We also met with Dr. Diakalia Sogodogo, new head of on-farm trials. We met for approximately two hours with eight farmers from two villages near the Cinzana Research Station to discuss aspects of the SM-CRSP project that had impacted their farming practices and families. Again, this group contained both farmers that were and were not participating in on-farm trials. Dr. Abou Berthe again led the discussion. All non-participating farmers wanted to be included in on-farm trials. All farmers were convinced that compost plus RP increased yield and was an economic input. This group which had been exposed to research and on-farm trials near the Cinzana Station knew where to purchase RP and its cost and indicated the quantitative yield increase that could be obtained by this practice. The farmers stated that the enhanced effect of compost plus RP on yield lasted for three years compared to one year for compost only. Most farmers indicated that uniform broadcasting of compost resulted in superior yield compared to traditional mound placement.

One very important aspect of the discussion with farmers near the Cinzana Research Station centered on the use of mineral fertilizer. In the 1998 baseline survey of farmers, only approximately 10% used mineral fertilizers. Farmers at this meeting estimated that today > 90% utilize mineral fertilizers. They stated that one of the major advantages to the use of fertilizer is that less land was used to produce a given quantity of grain. Therefore, their labor was significantly reduced. Farmers stated that mineral fertilizer could increase millet yield five- to six-fold under good rainfall conditions. Frank Smith, M. Doumbia, A. Berthe, and O. Coulibaly prepared a follow-up survey that will be taken later in July/August to determine if this perception is correct and to determine other impacts of SM-CRSP. Mamadou Doumbia asked Abou Berthe and Diakalia Sogodogo to cooperate with him in doing an analysis of five participating villages surrounding the Cinzana Station concerning the economics of mineral fertilizer use. The survey data should be available by August 30, 2001.

Significant time was also spent reviewing data files with Mamadou Doumbia. These files contain all raw and analyzed data collected in Mali over the past four years relating to the core study, the Ca and Mg movement study, and on-farm composting. Hons received a computer zip disk containing this information. Hons stressed that the data needs to be closely reviewed, with duplicate information removed and gaps filled. Much also needs statistical analyses and evaluations. Richard Kablan (University of Hawaii) is coming to Mali at the end of July and will spend the next month reviewing and statistically evaluating the SM-CRSP information.

A meeting with Roger Bloom (USAID Agricultural Officer) was held to review USAID priorities and strategies in Mali and to brief Roger on the activities of the SM-CRSP research program. Persons in attendance were Bloom, Mamadou Doumbia, Russell Yost, and Frank Smith. Roger stated that USAID continues to support market liberalization policies as the primary means of achieving food security in Mali. USAID is also interested in higher value crops such as mango, expansion of flooded rice, value-added processing, and improved efficiencies in water and nutrient management for Mali. Roger will be leaving soon to assume a position with USAID in Washington D.C. A replacement to Mali has not yet been selected.

Contacts in Mali:

LaboSEP-Sotuba

Dr. Mamadou Doumbia, Soil, Water, and Plant Laboratory

Mr. Adama Coulibaly, Agronomist

Dr. Abou Berthe, Head of Inter-CRSP Farming Systems Project

Mr. Sibiry Traore, GIS Specialist

Dr. Abou Acar, Sorghum Breeder

University of Mali-Katibougou

Dr. Mamadou Seydou Traore

Universite du Mali

Yehiea Haidara, Dean of the Faculte des Sciences Juridiques et Economiques

Cinzana/Segou/Dougouba

Dr. Samba Traore, Millet Program Coordinator, Cinzana Research Center

Dr. Mamadou Toure, Cowpea breeder, Cinzana Research Center

Dr. Diakalia Sogodogo, On-Farm Trials, Cinzana Research Center

Mamadou Alou, Engineer, Cinzana Research Center

Bamoussa Traore, Agent Technician, Cinzana Research Center

Lassana Djire, farmer-Dougouba

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USAID/Mali

Roger Bloom, Agriculture Officer