PN-AAZ-995

AID ASSISTANCE FOR SEED SUPPORT AND IMPROVEMENT IN SUDAN

(1983 - PRESENT)

==========

USAID Sudan
October 25, 1985

Reprinted 1/9/86

Table of Contents

TABLES

General Summary

A sequence of events began in 1983 with the release of Hageen Dura No. 1 (HD-1) Hybrid Sorghum and the early detection of signs for a potential severe drought. Food deficit projections by the Mission in mid-1984 served to focus AID attention on the importance and need for assistance not only for relief grain but also for seed and seed improvement.

AID assistance for seed improvement was initiated in late 1983, when AID programmed the use of LS 2.1 million in P.L. 480 Title III local currency counterpart funds for hybrid sorghum seed production and distribution by the National Seed Administration (NSA) at Sennar. AID assistance for seeds and seed improvement has increased dramatically in the past two years with the programming of US$ 5.6 million in 1985 for the off-shore procurement and production of seeds. In addition, LS 30.6 million from P.L. 480 counterpart funds was allocated for local seed procurement and distribution to various sites for the 1985 planting season, plus other seed improvement efforts.

U.S. Dollar funding has been programmed to assist Sudan with both short and long-term seed production and development needs. Approximately $180,000 in CIP funding was used to procure 130 metric tons of U.S. hybrid sorghum seed in 1985. Another $1.8 million in CIP funding has been programmed for the production of 1,000 metric tons of HD-1 hybrid sorghum seed from U.S. seed companies in the United States and Argentina for planting in Sudan in 1986.

In September, 1985 a Grant Agreement was signed between AID and the Government of Sudan to provide $3.5 million of OFDA funds for the emergency procurement of 7,500 metric tons of wheat seed from Egypt. The Grant Agreement contains a clause which specified that a portion of the sales proceeds will be used to establish a national seed development revolving fund. It is envisaged that the revolving fund will serve as an instrument through which funds generated from future public sector seed sales will be programmed directly for seed production and development activities in the Sudan.

In 1985 LS 24 million in local currency was used to fund emergency local seed procurement and distribution for planting by drought affected farmers in Western Sudan. The remaining LS 6.6 million have been programmed for the encouragement of long-term public and private sector development of hybrid sorghum plus improved millet and groundnut and other seeds.

The most significant seed effort has been the developments in the hybrid seed industry in Sudan in which AID is playing an important role. The production of HD-1 sorghum seed in Sudan has grown from 3 metric tons in 1983 to 194 tons in 1984 and an estimated 1,300 tons in 1985. Of even more significance is the fact that 11 private sector producers have planted 52 percent of the acreage involved.

Two of these private sector entities are receiving direct financial assistance from Title III counterpart funds, plus limited technical assistance. While it is not expected that all of these producers will be successful, their investments indicate an increasing interest and awareness of the potential of hybrid sorghum in this country. Projections based on average yields and normal rainfall show that U.S. financed seed procurements, both in dollars and local currency, carry a yield potential to produce an estimated 400,000 - 500,000 metric tons of food grain in 1985 and approximately 1.6 million metric tons in 1986. A good sorghum harvest in Sudan is considered to be 2.5 million metric tons, so the projected grain yields from AID financed seed inputs are significant. Production of 2.5 to 3.0 million metric tons of sorghum grain will in aggregate satisfy domestic requirements. However, this level of output does not take account of internal distribution problems or allow for possible exports.

Greater production and financial returns to producers are expected within the next five years as a result of AID's seed initiatives and encouragement to Sudan's emerging hybrid sorghum seed industry. We have been encouraged by the on-going seed improvement efforts, and plan to increase our level of effort in this area. In addition to work on hybrid sorghum we will also address the need for improved groundnut and millet seeds. We are also looking for ways to facilitate efforts of the private sector hybrid sorghum seed companies who have begun production this year.

Much of our activity in support of hybrid seed was initially in response to specific and limited requests from the Government of Sudan. Support for private sector seed multiplication fits the category of targets of opportunity as companies approached us and we responded positively with GOS concurrence. Much of the more recent activity has been of an emergency nature to reduce next year's food deficit. Consequently, the Mission has had no real seed strategy. Now we have initiated work within the Mission directed toward the development of a comprehensive strategy.Fortunately, two knowledgeable U.S. seed experts are currently in country. We will draw on their expertise. In addition, Dr. Gebisa Ejeta who developed HD-1, arrives October 29 with the Purdue and Pioneer seed people. They will be brought into our planning as well. An INTSORMIL expert currently working in cooperation with our Western Sudan Agricultural Research Project will also join the exercise. We are also contacting Mississippi state to explore prospects for inputs on their part. We see this effort as critical to our rehabilitation program. Like other rehabilitation activities, it will be incorporated into our development program.

I. HD-1 HYBRID SORGHUM UPDATE:

A) Potential and Yields:

Hageen Dura No. 1 (HD-1) hybrid sorghum seed sufficient to plant about 1,000 acres was released in 1984 to commercial and other growers for field testing and trials. Trials have demonstrated that HD-1 is an early maturing sorghum with desirable eating qualities and is easily adapted to existing production systems. In 1984, a year of severe drought in Sudan,

HD-1 under rainfed conditions produced yields that were about 85 percent higher than local varieties. In the irrigated areas the yields were about 300 - 400 percent higher than average yields of present varieties. These yield results demonstrate that Sudan should within 3-5 years should be able to produce substantially more sorghum or use less land for the production of sorghum thereby releasing existing arable land for the production of other crops for domestic and export use.

B) HD-1 Commercial Introduction Program:

HD-1 sorghum is the first high yielding elite hybrid sorghum variety bred and released by the GOS Agricultural Research Council (ARC) under an ICRISAT/Sudan Cooperative Sorghum and Millet Improvement Program. The GOS National Seed Administration (NSA) now has responsibility for maintaining and multiplying foundation seed supplies, for distribution to both public and private sector firms for the production of certified seeds.

The following table shows the increases in the areas and production of hybrid sorghum seed over the past 2 years.

Table 1

HD-1 Sorghum Acreage and Production in Sudan

Kind of Seed	Acreage 1984	Acreage 1985	Production (mt) 1984	Production (mt) 1985
Foundation Seed (all public sector)	15	40	-	-
Certified Seed				
- public sector	650	1,339	194	600*
- private sector	15	1,350	-	700*
Hybrid Grain Production (all private producers)	1,050	30,000	900	30,000*

* Projected

During 1985 AID has financed through the CIP program $232,500 for 1) the import of 130 metric tons of Pioneer hybrid sorghum (W-823-A), and 2) the importation of 6,000 pounds of male sterile (TX-623-A) sorghum seed to increase HD-1 breeder seed supplies for 1986. This followed a similar AID supported importation of a smaller quantity of TX-623-A male sterile sorghum seed in 1984.

In 1984 and 1985 AID provided short-term technical assistance to assist public and private sector hybrid seed producers and advise the National Seed Administration on it's hybrid sorghum production programs.

C) Certified Seed Production:

The infant hybrid sorghum industry grew rapidly from 665 acres planted for the production of certified seed in 1984 to 2689 acres planted in 1985. Even more remarkable than the 400 percent increase in planted acreage is the fact that 11 private sector producers with 52 percent of the planted acreage are participating in the 1985 HD-1 Certified Seed Production Program. Private sector plantings range in size from 30 to 640 acres as depicted in Table 2. It is not expected that all of the first time producers will be completely successful, but their investments do provide an indication of the interest hybrid seed producers have in producing seed to meet a potential 10,000 metric ton hybrid sorghum seed demand.

Table 2

Private Sector Hybrid Seed Producers
(1985)

Firm	Location	Acreage
Tawakul Co.	Silet Khartoum	250
Chemi Import Co.	Rahad	60
George Bersum	Sennar	80
Bahig Trade Co.	Sennar	40
Tenneco Seeds	Dongola	40
Radison Trade Co.	Managil	90
El Khidr Co.	Gezira	30
Gandul (Pioneer)	Rahad	30
Abdel Wahab	Gezira	40
Sudan Canadian Co.	Simsim	50
Arkel Int.	Abu Naama	640
	TOTAL	1350

Public Sector Hybrid Seed Production
(1985)

Organization	Location	Acreage
NSA	Sennar Main	95
NSA	Sennar West	115
NSA	K. El Girba	50
SGB	Barkat	979
MFC	Simsim	50
Rahad Corporation	Rahad	30
Blue Nile Project	Abu Gamai	20
	TOTAL	1339

With reasonable success in 1985, private and public sector production of certified HD-1 hybrid sorghum in Sudan could be as high as 1,300 metric tons. Local production of HD-1 for 1986 planting will be supplemented by supplies of HD-1 hybrid seed produced by U.S. seed companies in the United States and Argentina, where contracts have been negotiated for the production of up to 1,000 metric tons of HD-1 seed at a delivered cost, Port Sudan, of $1.8 million in CIP funding. This production combined with incountry production would provide a total of 2300 tons for 1986 production.

If HD-1 production both in Sudan and out of Sudan for 1986 planting reaches the 2,300 metric ton production target and most of the seed is planted on irrigated lands to maximize production, a yield of over 700,000 metric tons of sorghum is possible. A crop of this magnitude from hybrid sorghum above would equal 35 percent of the last 10 years average annual sorghum production (2 million mt per annum) from less than 8 percent of the 9 million acres normally devoted to sorghum production. Further, a crop of 700,000 mt would have a market value of over $60,000,000 at current world market prices.

The following table shows HD-1 hybrid seed production and commercial grain acreage and production increases by year:

Table 3

HD-1 Hybrid Seed Production, Grain Acreage and Production

Year	HD-1 Hybrid Seed Available (MT)	Commercial Grain Acreage Planted From HD Hybrid Seed	Production MT
1983	3	-	
1984	194	1,050	1,000
1985	2,300	30,000	30,000*
1986	-	700,000*	700,000*

*Estimated: 1300 mt produced in Sudan. 1000 mt produced offshore.

D) Future Plans:

Future plans for expansion of the HD-1 hybrid sorghum production program depends much on the success of this year's local and international private sector certified seed producers. Emphasis will continue to be on the expansion of the local private sector producers with production of offshore HD-1 production ending after 1986.

In addition, promising new hybrids of other varieties will continue to be tested and screened as new hybrids with more desirable qualities and production potential should be coming into the market by 1987.

It is envisaged that the role of the government and public sector in the production of certified hybrid sorghum seed or seed for food grain production will diminish as the private sector advances in Sudan. Ability of the private sector to move ahead will be conditioned on the lack of government controls which might inhibit or constrain the increased output of high quality certified seed to meet market demands, and for producers to sell the seed at free market prices. It is envisaged that the Government's role will be relegated to basic research under the aegis of the Agricultural Research Council.

More emphasis will be placed on Sorghum and Millet Research. USAID with INTSORMIL assistance is helping the government prepare a long-term five year Sorghum and Millet Research plan. Once this plan is prepared USAID will consider providing assistance through our Western Sudan Agricultural Research Project and through a follow on "Agriculture Research and Production Project" which is planned for FY 87 funding.

The Ministry of Agriculture's National Seed Administration will have responsibility for the production and multiplication of ARC developed foundation hybrid seed stocks, and inspection, testing and certification of seeds, and similar services usually performed by governmental seed regulatory agencies. Public sector companies may wish to produce certified seed for the sector's own use or sale in the free market. Mission interest and encouragement for the production of hybrid sorghums is strong as evidenced by AID's inputs over the last two years and is expected to continue, especially for assistance to the private sector.

USAID is also considering additional assistance to seed production efforts in Sudan. One proposal, by the Partnership For Productivity, a private voluntary organization, would provide assistance in the West to establish seed storage and to assist in production of seed by the private sector.

Another proposal is being reviewed now from the Purdue University and Pioneer Overseas Corporation to provide both research and other assistance to the Government and to the private sector. USAID is also considering assistance to the private sector either in the form of local currency loans through banks or through the Commodity Import Program for facilities and equipment. Consideration will also be given to the use of USAID/PRE Bureau funding to assist one or more US private sector companies to provide help to local companies in joint venture arrangements.

II. OTHER SEED SUPPORT PROGRAMS:

A) Emergency Procurement of Sorghum and Millet Seed Program:

The 1985 "Western Sudan Rehabilitation Seed Reserve Initiative Project" (650-9005) was conceived in late 1984. This project was designed to provide LS 14 million in local currency from the USAID administered trust fund

account for the local procurement of 6,000 metric tons of millet and sorghum seeds for distribution to small traditional farmers in the crop failed areas of Western Sudan. Since Northern Kordofan and Northern Darfur had complete crop failures in 1984, these regions were designated as the primary target areas for the seed reserve initiative. The project was intended to provide about one third of the total seed needs in the target areas, under the assumption that some seed stocks were available, or other donors would be forthcoming in financing procurement of additional seed.

The seed procurement target was eventually raised to 7,000 metric tons (mt) with around 4,000 mt of early maturing varieties of sorghum and slightly over 3,000 mt of adapted varieties of millet seed being procured through direct USAID procurement from areas of Sudan that had a fair crop in 1984. The National Seed Administration was responsible for handling, cleaning and bagging seed in 5 kilo bags. Processed seed was then transported to eleven seed distribution centers in the target areas where voluntary agencies provided oversight for seed distribution through Sudanese channels to target farmers. It was projected that if only 75-80 percent of the sorghum and millet seeds procured was planted in the target areas, especially with this year's drought breaking rains, the potential output would be about 400,000 metric tons of food grain. However, although prospects for a normal crop appeared good through September, a final assessment of the actual production level will not be available until late December or early January 1986.

It is known that some farmers in the drought affected areas planted seeds of the U.S. imported food grain sorghum. The seed reserve project was designed to preclude the planting of food grain for seed to the extent possible. However, for those farmers without seed it is rationale to think that it would be better to plant seed of dubious origin than not to plant any seed. Thus, although the food grain sorghum is assumed to have been produced in the U.S. entirely from hybrid seed, the progeny of which is not normally recommended for planting, some grain will be produced despite "skeptics" assertions to the contrary. In some cases farmers may actually receive yields as large or larger than they would have received from planting the traditional long season varieties of sorghum seed they normally plant. However, the planting of food grain produced from hybrid sorghum is not to be encouraged. It is hoped that the build-up of seed supplies from the locally procured early maturing, varieties of millet and sorghum seed distributed in Western Sudan will be sufficient for all farmers who want them in the West in 1986. Early reports from AID project scientists indicate that some of the varieties of millet and sorghum seeds procured under the project from Eastern Sudan appear to be higher yielding and have more desirable characteristics than some of the varieties traditionally grown in the West. If this information proves to be correct, the positive effects of Project 650-9005 will reach well beyond the need to assist the food production sector in the West to recover from the effects of the 1983/84 droughts.

B) Wheat Seed:

During 1984 winter wheat was not planted in the irrigated schemes because of low Nile waters resulting from the severe drought of 1984. However, because of good rains during this past crop year the GOS is promoting the planting of wheat in the fall of 1985. The goal is to expand wheat acreages to reduce Sudan's dependence on imported wheat in 1986.

Seed supplies held over from the 1983/84 winter crop were insufficient, however, to plant the planned acreages. The Ministry of Agriculture submitted a request in June, for AID assistance to procure 13,000 metric tons of wheat seed for planting in October 1985. After reviewing the request for wheat seed, AID committed $3.5 million in OFDA funding to procure 7,500 metric tons (all that was available) of three adapted varieties of wheat seed from Egypt.

One of the varieties, Sakha 69, is reported to have a yield potential of 15-20 percent greater than other varieties normally planted. Thus, if these yield potential projections hold up the large-scale introduction and growing of greater acreages of Sakha 69 may assist Sudanese wheat growers to improve the economics of wheat growing in Sudan.

C. Groundnut Seed

Groundnut production was very low in 1984 as a result of the drought. In fact supplies of Berberton groundnut seeds, the most widely used variety in Western Sudan, was so low that neither AID nor the other donors could seriously consider responding to the Government's request for financial assistance to procure 37,000 metric tons of groundnut seed for the 1985 planting season. Further, AID's priorities with food grain and seeds were focused on assistance for resolving the food deficit. Therefore, AID priorities for assistance for alleviate the cash crop seed (groundnut and sesame seeds) shortages were much lower. Some of the other donors eventually did provide some assistance in a very small way for groundnut and sesame seed procurement.

AID did respond to a Ministry of Agriculture request for the importation of 4.5 metric tons of a locally tested, high yielding variety (Spanco EM-9) of groundnut seeds from the United States. CIP funding of $29 thousand dollars was used to procure this foundation seed for multiplication and distribution by NSA to farmers in the West in 1986. It will take several years at present seed multiplication rates to build adequate supplies of Spanco seed for the West to replace the lower yielding Berberton variety now grown. Plans are under consideration to import greater quantities of high yielding groundnut seed in 1986 to accelerate the build up of the groundnut seed supply in the West.

D) Miscellaneous Seed Support:

Local currency support for the production of improved varieties of millet seed and assorted winter crop seeds is being provided to a U.S. firm backed agricultural venture at Dongola in Northern Sudan.

III. CONCLUSIONS:

A. "Summary of AID Assistance For Seed Support" Follows as Table 4.

Although AID has supported and provided the use of substantial amounts of local currency and U.S. dollar funding for seed support and improvement in Sudan, in the last two years, much remains to be done if the momentum of the seed initiatives are to be maintained. An expansion and broadening of seed support efforts, especially to the private sector coupled with adequate amounts of rainfall and water for irrigation are considered essential, if Sudan is to recover it's former agricultural food production and export base.

Table 4

Summary of AID Assistance For Seed Support

A. Local Currency Funded Assistance

ACTIVITY	COST 1983/1984	1985	TOTAL PROJECTED COSTS	REMARKS
	LS	LS	LS	
1. Sudan Seed Production (NSA, Sennar/FAO)	1,250,000	350,000	1,600,000	
2. Improved Seed Production	225,000	600,000	855,000	
3. Improved Seed Production	-			
a) Arkel/Dekalb Hybrid Sorghum Seed	-	2,841,460	2,841,460	
b) Tenneco Seed and Agricultural Activities	-	695,000 (Seed activities only)	695,000	LS 1,630,500 provided for all activities
4. Agricultural Bank of Sudan	-	3,000,000	3,000,000	Loan for Seeds
5. Dura and Oil Seeds	150,000	-	150,000	
6. Western Sudan Seed Reserve Initiative Project (650-9005)	-	14,000,000 (Plus LS 9,113,540 Estimated Transport Cost)	14,000,000 9,113,540	Local procurement, processing, handling, distribution of 7,200 mt of sorghum and millet seeds.
LS TOTALS	1,625,000	30,600,000	32,255,000	

B. U.S. Dollar Funded Assistance

TYPE	QUANTITIES	COSTS 1985	TOTAL TOTAL COSTS	REMARKS
1. Hybrid Sorghum Seed	130 mt	$ 175,500	$ 175,500	Pioneer W-823-A sorghum for grain sorghum. Imported from U.S. in 1985.
2. HD-1 Parental Male-line (TX-623-A Sorghum Seed)	3 st	47,000	47,000	For in-country production of HD-1 Sorghum. Imported from U.S. in 1985.
3. Offshore Production of HD-1 Sorghum	1,000 mt	1,800,000	1,800,000	Offshore procurement of up to 1,000 mt of HD-1 hybrid sorghum from U.S. and Argentina for 1986 planting.
4. Procurement of Improved Groundnut Seed	4.5 st	28,620	28,620	Spanco EM-9 groundnut seeds imported from U.S. for foundation seed planting in 1985.

continued //

TYPE	QUANTITIES	COSTS 1985	TOTAL TOTAL COSTS	REMARKS
5. Procurement of Wheat Seed From Egypt	7,000 mt	3,500,000	3,500,000	Importation of 7,500 of 3 varieties of wheat seed. Giza 155, Sakha 69, and Nile Valley for food grain production and seed multiplication.
6. Procurement Hybrid Sorghum and Other Field Seeds	-	94,000	94,000	CIP Funded private sector importation of Pioneer hybrid sorghum forage and grain seeds, Alfalfa seeds, etc. Imported from U.S.
US$ TOTALS		$ 5,645,120	$ 5,645,120	

mt - Metric Ton
st - Short Ton

1985 ASSISTANCE

LS	30,600,000
US$	5,645,120