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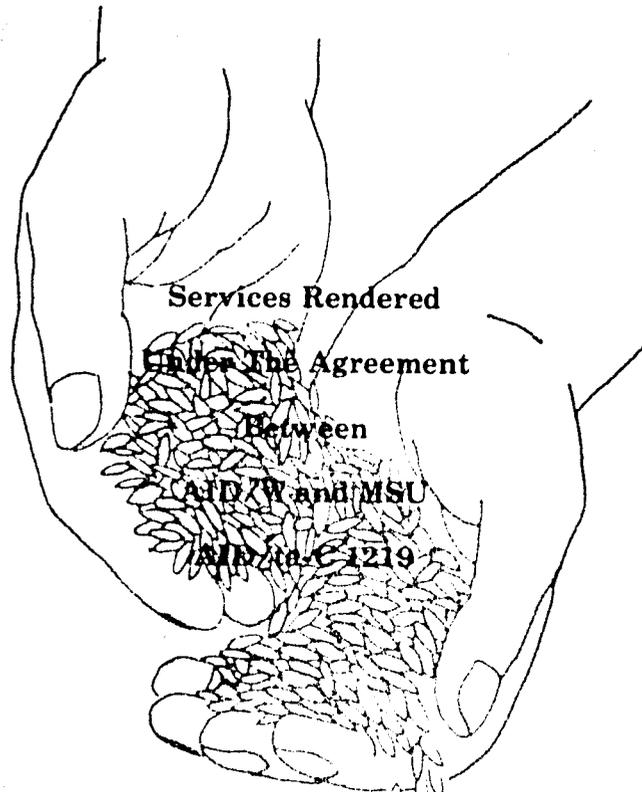
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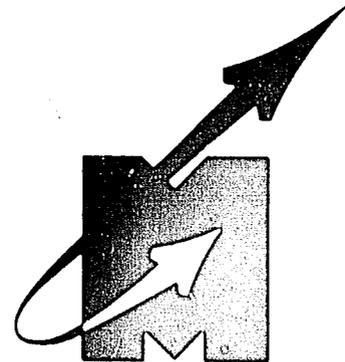
UPPER VOLTA
SEED MULTIPLICATION PROJECT



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AID/W and MSU
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REPORT TO USAID/UPPER VOLTA
AND AID/W
ON
UPPER VOLTA SEED MULTIPLICATION PROJECT

Services Rendered
Under the Agreement
Between
AID/W and MSU
AID/ta-C-12-19

SEED TECHNOLOGY LABORATORY
Mississippi State University
Mississippi State, Mississippi

November, 1975

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REPORT SUMMARY

TITLE: Report to USAID/Upper Volta and AID/W on Upper Volta Seed Multiplication Project

CONTRACT: Services under AID/ta-C-12-19

CONSULTANTS: G.M. Dougherty, Assistant Professor of Agronomy,
Seed Technology Laboratory, Mississippi State University

PERIOD OF REPORT: 21 September - 20 October, 1975

SUMMARY

A modest seed multiplication project has been undertaken by the U.S. in Upper Volta. U.S. assistance to the Government of Upper Volta in addition to organizing training programs, provides for minimum essential facilities and equipment for a Seed Testing Laboratory and equipment and storage facilities to four major seed multiplication stations and selected Regional Development Organizations responsible for seed multiplication activities.

Some of the equipment recommended for purchase, as a U.S. input into the project, has been supplied by other sources. Additional equipment items are being considered for contribution. To eliminate duplication of equipment, USAID/Upper Volta requested technical assistance to: re-evaluate existing equipment procurement lists; prepare specifications for equipment requiring purchase and to prepare layout drawings for structures requiring construction.

Specifications of equipment and supplies needed are included in the report. These items are estimated to cost \$126,731 FOB, Suppliers. Should an equipment contribution by the Austrian Government be accepted by the Government of Upper Volta the cost of equipment to the U.S. project would be reduced to \$89,731. Over-all savings to the U.S. project, including equipment and building construction, if the contribution is accepted is estimated at \$77,800.

Building layout plans for structures requiring construction are included as part of the report. Construction costs are estimated at \$279,070 if the Austrian Government contribution is accepted.

It is recommended that USAID/Upper Volta encourage the Government of Upper Volta to accept the Austrian equipment contribution.

ACKNOWLEDGEMENTS

This report is the product of a four week consultation assignment with the USAID Mission in Upper Volta.

The author wishes to acknowledge the excellent cooperation of the USAID Mission, Madame Rose Marie Sanwidi, Chief, National Seed Service, and many individuals in Upper Volta during the consultation period.

Mr. Richard Meyer, Manager, Seed Multiplication Project was especially helpful during the period covered by this report. He served as a consultant traveling companion, as well as being a gracious host.

George M. Dougherty

REPORT TO USAID/UPPER VOLTA AND AID/W
ON THE
UPPER VOLTA SEED MULTIPLICATION PROJECT

21 September - 20 October, 1975

FORWARD

A U.S. Sahel Midterm Planning Committee, in April 1974, explored the feasibility of an expanded seed production and supply program for Upper Volta. The Government of Upper Volta (GOUV) sought U.S. assistance in the establishment of such a program.

Establishment of a modest Seed Multiplication Project was subsequently approved. As envisaged, U.S. assistance in addition to organizing training programs, would provide minimum essential facilities and equipment for a National Seed Service Headquarters and Seed Testing Laboratory, and facilities and equipment to four major seed multiplication centers and selected Regional Development Organizations (ORDs) responsible for seed multiplication activities.

TERMS OF REFERENCE

Following approval of the Seed Multiplication Project some equipment items recommended in the project for procurement, as part of the U.S. contribution, were provided or have been offered as a contribution by other sources. USAID/Upper Volta, to eliminate unnecessary duplication of equipment, requested technical assistance to: re-evaluate existing equipment procurement lists; prepare detailed specifications and cost estimates for equipment requiring procurement; and to prepare layout drawings for facilities requiring construction.

The assistance requested, following approval by AID/W, was provided by Mississippi State University under the MSU-AID/ta-C-12-19 Contract.

CURRENT SITUATION

A. National Seed Service:

The National Seed Service (NSS) was established by issuance of an official Arrete in May, 1975. The Service is composed of a Production section and a Control and Certification section. Each section is charged with responsibilities as follows:

Production:

1. To elaborate the seed policy of the country and to fix the annual objectives for the production of seed in collaboration with research and development agencies.
2. To promote the introduction and spread of new varieties and to record those varieties selected for distribution.
3. To work out with research and development agencies local field trials, including selection of sites for the trials.

Control and Certification:

1. To control and promote regulations to maintain varietal purity.
2. To guarantee the purity and identification of varieties of seed produced by means of laboratory and field standards.
3. To verify the condition of seed of which the section will guarantee the origin.
4. To deliver (after packaging) a certificate of guarantee in reference to the standards of quality of which the section is trustee.
5. To prove by the preservation of check samples the quality of seed distributed in case of disputes.
6. To instill in the farmers respect for the decisions of the Special Committee of Agronomical Research in matters related to seed.

Since establishment of the National Seed Service the only staffing provided has been the appointment of Madame Rose Marie Sanwidi as Chief of the service. There is a critical need for additional staffing if the NSS is to function as envisaged.

B. Seed Production:

Seed was distributed for planting in the Spring, 1975. Actual quantities of seed distributed could not be determined but the figure is believed

to be considerably lower than the 400 MT's that were available for distribution.

Most of the seed produced, for planting in 1975, were varieties that performed well in tests conducted on major research stations; little attention was given to "farmers preferences" relative to selection of varieties. Consequently, over-production of some varieties and under-production of others resulted. The same situation will exist in 1976. Seed supplies for 1976 plantings are being estimated at 400 MT's (all seed kinds).

Improvements in the supply - demand situation are expected in 1977. Meetings with research station personnel, production planners, and Regional Development Organization (ORD) representatives are being scheduled for late 1975 to select varieties to be multiplied in 1976.

Seed was multiplied in 1974 on major research stations under a European Development Fund (FED) Grant. Income received from seed sales in 1975 was expected to finance multiplication activities in 1975. Revenues actually collected, due to nonpayment and small quantities distributed, failed to provide adequate funds to finance 1975 production costs. Since the FED Grant was for only one year, research stations were compelled to use research project funds to subsidize their seed multiplication activities. Research Station personnel consider this to be a misuse of research funds. Consequently, reductions in station multiplication activities are anticipated unless additional funding is forthcoming.

Improvements in production planning and establishment of R2 and R3 generation production, processing and distribution centers in the ORD's should alleviate some of the problems being experienced by the research stations. Efforts to improve production planning and the establishment of ORD centers is underway. Unfortunately, before the ORD's can accept much responsibility, personnel must be trained.

Critics far outnumber the supporters of the varietal development work being conducted on research stations. Station personnel are among the strongest critics. The criticism most frequently heard is that too much emphasis has been placed on achieving high yields using introductions grown under very favorable conditions relative to fertilization and cultural practices; practices not applicable for use on most farmers' fields.

A shifting of emphasis away from "high" toward "better" yielding varieties has begun. This work includes the purification of good local varieties and greater use of local varieties in breeding programs. Varieties being developed will be field tested, employing cultural practices adaptable to general farmer use, before being recommended for release. This research is not expected to have much impact on agricultural production for several years.

C. Seed Marketing:

The seed distribution system being employed is simple. An ORD representative informs the NSS as to his region's need for seed. The NSS then issues a certificate that authorizes him to obtain the seed from one of the multiplication (research) stations. Farmers then go to the ORD Center to obtain their seed. Farmers are permitted to purchase seed directly from the research station if they so desire.

Seed prices are based on commercial food or grain prices. Following issuance of an Arrete establishing food and grain prices the Ministry of Agriculture establishes seed prices. The Arrete governing seed prices in 1975 contained the following provisions:

1. ORD's purchasing seed (Millet, Maize, Sorghum, Rice) from major multiplication stations paid 30 percent above grain prices. Prices established for Millet, Maize and Sorghum was 29 CFA/Kg.; for rice, 45 CFA/Kg.

2. ORD's purchasing peanut seed from major multiplication stations paid 15 percent above food price. Price paid for peanuts (in hull) was 32 CFA/Kg.
3. ORD's retail price of seed to farmers is based on the price paid by the ORD plus a "fixed" margin.

Seed prices established by the Arrete covers only the price of the seed. Multiplication stations are permitted to add charges to cover cost of bags, treatment materials, etc. For example, the actual selling price of millet, maize and sorghum to ORD's in 1975 was reported to be 40 CFA/Kg.

Multiplication station personnel are dissatisfied with the Government pricing policy. They maintain that prices established in 1975 failed to cover production and handling costs. It was reported that a price of 40 to 60 CFA/Kg. for millet, maize and sorghum was necessary if seed is to be handled correctly by multiplication stations.

CURRENT SITUATION AND RECOMMENDATIONS

A. Buildings, Equipment and Supplies:

1. Seed Service Headquarters -- Establishment of a Seed Service Headquarters complex consisting of an office - Laboratory building (360 M²) and a seed storage warehouse (160 M²) was included as a U.S. project input.

The office - Laboratory building is provided to accommodate principal officers of the Seed Service i.e. Director; Chief, Technical Service; Chief, Quality Control; their supporting staff and a seed testing laboratory workroom. A recommended building layout was prepared (Dwg. Sheet 1). The structure, 331 M² in size, is estimated to cost \$56,270. This is \$10,270 above the cost of a 360 M² building recommended for construction in the project paper. Increased construction costs account for the cost estimate differential.

Seed Testing Laboratory equipment and supplies recommended for purchase (Appendix 1) are estimated to cost (FOB Supplier) \$9,935.00. This

estimate is \$2,921 above costs estimated in the project paper. The difference is due to increased product costs.

The seed storage warehouse is provided to accommodate a central storage area for seed to be distributed to farmers and ORD's from Ouagadougou. A recommended building layout plan, based on a building design previously prepared by the Direction de L'Hydraulique de L'Amenagement et de L'Espace Rural has been prepared (Fig. 1, Dwg. Sheet 2). This structure, 168 M² in size is estimated to cost \$16,800, which is approximately \$1,800 above the building cost estimate in the project paper.

Equipment and supplies for use in the seed storage warehouse are being recommended for purchase (Appendix 2). These items, though not included in the project paper, are considered essential for an efficient operation. Cost of these items is estimated at \$11,531 (FOB supplier).

2. Major Seed Multiplication Centers -- U.S. inputs in terms of building construction, equipment and supplies to support seed multiplication activities at four major seed centers, namely Kamboinese, Vallee du Kou, Niangoloko and Saria, are called for in the project paper. Each center is considered independently in this report.

- a) Kamboinese -- A Ministry Directorate for Agricultural Services (DSA) Station at which seed of rice and maize will be produced and stored.

A seed storage warehouse building plan (Fig. 2, Dwg. Sheet 2), 280 M² in size has been prepared. Construction costs are estimated at \$28,000 (\$100/M²). This is \$2,000 lower than the estimate appearing in the project paper.

Some of the equipment and supply items recommended for purchase in the project paper have already been supplied by other sources. Some supporting items still require purchasing. A listing of recommended purchases are presented in Appendix 3. Cost of these purchases are estimated at \$11,400 (FOB supplier).

- b) Vallee du Kou -- A station controlled by the Bobo-Dioulasso ORD and assisted by CERCI, at which rice will be pro-

duced, processed and stored.

A seed storage warehouse, 280 M² in size (Fig. 2, Dwg. sheet 2), is recommended for construction. Building construction cost is estimated at \$28,000 (\$100/M²).

Some of the equipment and supply items recommended for purchase in the project paper have been by other sources. Cost of supporting items being recommended for purchase (Appendix 4) is estimated at \$11,070 (FOB, supplier).

- c) Niangoloko -- An IRHO station at which peanuts will be the principal crop for the immediate future.

None of the equipment currently being considered for contribution by other sources is applicable to peanut seed processing operations. Consequently, equipment required at this station will be provided by the project. It is recommended that in processing operations peanuts not be shelled. This opinion is shared by supervisory personnel at the station. Equipment and supplies recommended for purchase are shown in Appendix 5. Cost of purchases is estimated at \$26,070 (FOB Suppliers).

It is recommended that the peanut processing equipment not be housed within the seed storage warehouse. Construction cost of a separate building to house the processing equipment was not included in the project paper. A layout plan for a processing building (or covered shed) and a seed storage warehouse has been prepared (Fig. 3 - Dwg. Sheet 2). Construction costs are estimated at \$48,000 (\$100/M²). This is \$18,000 higher than the building construction cost estimate in the project paper for the Niangoloko Station.

- d) Saria -- An IRAT station with responsibility to multiply, process and store seed of millet, maize and sorghum. Major processing equipment items recommended for installation are included in a contribution offer from the Austrian Government to the Government of Upper Volta (GOUV). It is recommended that USAID/Upper Volta encourage the GOUV to accept the Austrian proposal. Should acceptance of the offer be forthcoming, equipment and construction cost savings to the project would approximate \$78,000 (Table 1).

If the Austrian Government offer is accepted, supporting equipment and supplies recommended for purchase to compliment the Austrian equipment is estimated to cost \$9,820, FOB Supplier (Appendix 6).

3. Austrian Government Offer -- Six seed installations, for the processing of sorghum and millet, are being offered to the GOUV. Items included in the offer (Heid) include threshers, seed cleaner, seed treater, bagging scales, bag closer, elevators, a generator and a 784 M³ prefabricated steel building.

TABLE 1. Breakdown of Saria seed installation costs to be financed by Seed Project if Austrian Government offer is (a) Accepted, (b) Rejected, by the GOUV.

A. <u>Offer Accepted:</u>	<u>Cost Estimate</u> <u>(\$ U.S.)</u>
1. Building construction (slab req'd.).....	\$ 8,000.00
2. Major equipment items.....	N.C.
3. Supporting and misc. items.....	\$ 9,820.00 ^{1/}
4. Equipment replacement parts.....	\$ 800.00 ^{1/}
5. Equipment installation ^{2/}	<u>N.C.</u>
	Total Cost \$18,620.00
B. <u>Offer Rejected:</u>	<u>Cost Estimate</u> <u>(\$ U.S.)</u>
1. Building construction (2 bldgs. req'd.).....	\$48,000.00
2. Equipment and misc. items.....	\$44,420.00
3. Equipment installation ^{2/}	<u>\$ 4,000.00</u>
	Total Cost \$96,420.00

^{1/} FOB Suppliers

^{2/} Excluding Labor Costs

NOTE: Savings to U.S. Seed Project (\$96,420.00 - \$18,620.00) = \$77,800.00

Additionally, Heid will supervise erection of the building and installation of the equipment including training (30 days maximum) at one of the installations.

The offer includes most of the major seed processing equipment items required to process sorghum, millet, rice and maize. Items such as a corn sheller, additional cleaner screens, moisture tester, bag trucks, etc. (Appendix 6) will be required to compliment the basic items being supplied by Heid.

The U.S. seed project can use one of those installations for the Saria multiplication station. Although not within the scope of the present U.S. seed project three of the remaining five installations should be considered for possible use at ORD seed centers namely Banfora, Bobo-Dioulasso and Fada N'Gourma. It is very possible that other International organizations engaged in Agricultural improvement projects in Upper Volta could make use of at least two seed processing installations.

4. Regional Development Organizations -- Within the scope of the project assistance is designated for ORD's in which R_2 and R_3 generation seed will be produced. ORD's selected for support are: Ouagadougou (Mogtedo), Bobo-Dioulasso, Banfora and Fada N'Gourma. Seed storage warehouses will be constructed at all four ORD's; equipment is to be purchased only for Mogtedo.

A seed storage warehouse building plan (Fig. 4 - Dwg. Sheet 2) was prepared. Identical structures are recommended for all four locations. Each structure, $235 M^2$ in size, is estimated to cost \$23,500.

Some equipment items recommended in the project paper for purchase and installation at Mogtedo have been provided by other sources. Cost of supporting equipment and supplies still required (Appendix 8) is estimated at \$8,150, FOB, Supplier.

SUMMARIZATION OF COSTS
(Buildings, Equipment and Supplies)

Estimated costs of building construction recommended (all locations) are summarized in Table 2. Construction costs (total) are estimated at \$279,070 based on preliminary construction cost estimates provided by FED. These estimates, however, were considerably lower than estimates obtained from the Direction de L'Hydraulique de L'Amenagement et de L'Espace Rural in Ouagadougou. The lower estimate (FED) was used on advice from F.M. Bergier, Regional Engineer, REDSO/Abidjan.

Estimated cost of equipment and supplies (for all locations) are summarized in Appendix 9^{1/}. Cost of these items are estimated at \$00,000, FOB Supplier. Allowance for a 15% inflation price increase and 40% crating and shipping charge added to the FOB estimate makes the CIF Port of Entry cost estimate \$144,461.

Equipment and supply items recommended for purchase (Appendix 9) do not include field equipment and supply items such as trucks, tractors, farm implements, office furnishings or fertilizer. Quantities required and cost estimates of these items can best be determined by local mission personnel.

Although most of the items in Appendix 9 are expected to be purchased in the U.S., some items will require purchasing from European countries. Items known to be available only from Europe are:

1. Replacement parts for Colombini equipment (Mfg. in Italy).
2. Replacement parts for Heid equipment (Mfg. in Austria).

Some equipment items in addition to the above may require procurement from other than U.S. suppliers. Reference is made to scales that, for effective use in Upper Volta, should be calibrated in metric units of measurement.

Specifications, including possible U.S. source references, for equipment

^{1/}Based on assumption Austrian equipment offer is accepted.

TABLE 2. Summary of building construction cost estimates (all locations)

No. Req'd.	DESCRIPTION	Extension Cost ^{1/} (\$ U.S.)
1	Seed Service Headquarters Building ^{2/}	\$ 56,270.00
1	Central Seed Storage Building ^{2/}	\$ 16,800.00
2	Seed Storage Building ^{3/}	\$ 56,000.00
1	Seed Processing and Storage Building ^{4/}	\$ 48,000.00
4	Seed Storage Building ^{5/}	\$ 94,000.00
1	Concrete Slab ^{6/}	\$ 8,000.00

Total Cost \$279,070.00

^{1/} Estimates By FED

^{2/} Ouagadougou

^{3/} Kamboinese and Valle du Kou

^{4/} Niangoloko

^{5/} Mogtedo, Bobo Dioulasso, Banfora, Fada N'Gourma

^{6/} Saria (if Austrian Gov't. offer accepted)

required (at all locations) appear in Appendices 10 and 11. Appendix 11 contains specifications and cost estimates of additional equipment required if the Austrian equipment offer is rejected. Addresses of possible suppliers of equipment items in Appendices 10 and 11 are shown in Appendix 12. It is recommended that procurement of items known only to be available from Europe be arranged through GOUV channels.

Status of warehousing for seed storage is summarized in table 3. Storage capacity, based on 40 percent of the structure being occupied by seed, is estimated at 2,780 metric tons. Due to the need for storing several seed kinds and several varieties within each kind at each storage facility, 40 percent space occupancy constitutes near maximum seed storage capacity. Storage space presently under construction and being planned for construction will supply warehousing for 78 percent of all seed to be supplied by the National Seed Program in 1979. It is recommended that building layout drawings (Dwg. Sheet 2) be submitted to the Direction de L'Hydraulique de L'Amenagement et de L'Espace Rural for preparation of blueprints. On completion, prints should be reviewed (if possible) by FED to obtain reliable current construction cost estimates.

TABLE 3. Summary of Seed Project seed storage capabilities.

LOCATION	STATUS	CAPACITY (MT's)
Farako-Ba	Near Completion	160
Ouagadougou	Planning Stage	200
Kamboinese	"	360
Vallee du Kou	"	360
Niangoloko	"	360
Mogtedo	"	300
Bobo-Dioulasso	"	300
Banfora	"	300
Fada N'Gourma	"	300
Saria ^{1/}	"	140

Total 2,780 ^{2/}

^{1/} Included in Austrian Gov't. Offer

^{2/} 78 Percent of Estimated Seed Needs in 1979

APPENDICES

APPENDIX I.

SEED TESTING LABORATORY EQUIPMENT AND SUPPLIES

No. Req'd	ITEM	Cost ^{1/}
1	Seed Divider	\$ 240.00
2	Gram Scales	\$ 210.00
2	Torsion Balance	\$ 730.00
2	Class "P" Weight Sets	\$ 100.00
2	Purity Work Boards	\$ 120.00
3	Desk Lamps	\$ 300.00
2	Triplex Magnifier	\$ 40.00
12	Forceps, Coarse Point	\$ 35.00
12	Forceps, Fine Point	\$ 40.00
25	Grain Sample Box (1 qt.)	\$ 30.00
24	Grain Sample Box (1 pt.)	\$ 25.00
24	Hand Screens (1 set)	\$ 230.00
1	Seed Blower	\$ 830.00
6	Sample Pans, Triangular	\$ 40.00
6	Sample Pans, Spout Type	\$ 50.00
6	Sample Pans, Round Type	\$ 10.00
1,000	Spear Envelopes, (8 oz.)	\$ 50.00
2,000	Spear Envelopes (5 kg's)	\$ 120.00
72	Crispers W/Covers (plastic)	\$ 120.00
2 reams	Germination Towels, (10,000 sheets)	\$ 150.00
1 ream	Germination Blotters (5,000 sheets)	\$ 300.00
6	Germinators	\$ 3,300.00

APPENDIX I (cont.)

No. Req'd.	ITEM	Cost ^{1/}
24	Thermometers	\$ 120.00
3	Seed Triers	\$ 90.00
1	Oven	\$ 500.00
1	Moisture Tester	\$ 800.00
3	Sling Psychrometer	\$ 105.00
100	Petri Dishes, Plastic (6" dia.)	\$ 20.00
20 pkgs.	Filter Paper, (15 cm. dia.) (100/pkg.)	\$ 30.00
1	Stereozoom Microscope	\$ 600.00
---	Assorted Lab. Supplies	\$ 600.00

^{1/}Estimated, FOB Supplier

(Sub-total) \$ 9,935.00

APPENDIX 2.

NATIONAL SEED SERVICE WAREHOUSE EQUIPMENT AND SUPPLIES

No. Req'd.	ITEM	Cost ^{1/}
1	Platform Scales	\$ 330.00
2,000	Wire Ties	\$ 30.00
2	Twisters	\$ 30.00
1	Elevator Assembly	\$ 1,190.00
1	Seed Treater (dust)	\$ 1,600.00
4	Bag Trucks	\$ 400.00
2	Shovel (scoop)	\$ 36.00
1	Bag Closer	\$ 600.00
1	Grain Scale w/weight set	\$ 920.00
2	Hand Scoops	\$ 15.00
6	Aluminum Baskets	\$ 45.00
1	Bag Conveyor	\$ 1,000.00
4 doz.	Bag Needles	\$ 35.00
-	Misc. Supplies (brooms, string, tools, etc.)	\$ 500.00
1	Generator (9 Kw.)	\$ 4,000.00
1	Surge Bin	\$ 800.00

^{1/}Estimated, FOB Supplier

Sub-total \$11,531.00

APPENDIX 3.

EQUIPMENT AND SUPPLIES FOR KAMBOINSE

No. Req'd.	ITEM	Cost ^{1/}
1	Bagger Weigher	\$ 900.00
1	Bag Conveyor	\$ 1,000.00
1	Blower	\$ 200.00
1	Vacuum	\$ 550.00
6	Aluminum Baskets	\$ 45.00
1	Platform Scales	\$ 330.00
2	Shovel (scoop)	\$ 36.00
1	Gram Scales	\$ 104.00
1	Seed Trier	\$ 30.00
1	Moisture Tester	\$ 800.00
2,000	Wire Tires	\$ 30.00
2	Twisters	\$ 30.00
6	Sample Pans, Round	\$ 10.00
4	Bag Trucks	\$ 440.00
2	Maize Shellers (hand)	\$ 80.00
2	Hand Scoops	\$ 15.00
-	Parts for Columbini Cleaner & Treater	\$ 1,800.00
-	Misc. Supplies (brooms, string, tools, etc.)	\$ 400.00
1	Generator (9 Kw.)	\$ 4,000.00
1	Bag Closer	\$ 600.00

^{1/}Estimated, FOB Supplier (\$US)

Sub-total \$ 11,400.00

APPENDIX 4.

EQUIPMENT AND SUPPLIES FOR VALLEE du KOU

No. Req'd.	ITEM	Cost ^{1/}
1	Bagger - Weigher	\$ 900.00
1	Bag Conveyor	\$ 1,000.00
1	Blower	\$ 200.00
1	Vacuum	\$ 550.00
6	Aluminum Baskets	\$ 45.00
1	Platform Scales	\$ 330.00
2	Shovel (scoop)	\$ 36.00
1	Gram Scales	\$ 104.00
1	Seed Trier	\$ 30.00
1	Moisture Tester	\$ 800.00
2,000	Wire Ties	\$ 30.00
2	Twisters	\$ 30.00
6	Sample Pans, Round	\$ 10.00
2	Bag Trucks	\$ 440.00
2	Hand Scoops	\$ 15.00
1	Grain Scale W/Weight Set	\$ 920.00
1	Bag (heat) Sealer	\$ 630.00
1	Bag Closer	\$ 600.00
1	Generator (9 Kw.)	\$ 4,000.00
-	Misc. Supplies (brooms, string, tools, etc.)	\$ 400.00

^{1/}Estimated, FOB Supplier (\$US)

Sub-total \$ 11,070.00

APPENDIX 5.

EQUIPMENT AND SUPPLIES FOR NIANGOLOKO

No. Req'd.	ITEM	COST ^{1/}
1	Bagger-Weigher	\$ 900.00
1	Bag Conveyor	\$ 1,000.00
1	Blower	\$ 200.00
1	Vacuum	\$ 550.00
6	Aluminum Baskets	\$ 45.00
1	Platform Scales	\$ 330.00
2	Shovel (scoops)	\$ 36.00
1	Gram Scales	\$ 104.00
1	Moisture Tester	\$ 800.00
2,000	Wire Ties	\$ 30.00
2	Twisters	\$ 30.00
2	Hand Scoops	\$ 15.00
6	Sample Pans, Round	\$ 10.00
4	Bag Trucks	\$ 440.00
1	Elevator Assemblies (17ft. d.h.,	\$ 1,200.00
2	Elevator Assemblies (13ft. d.h.)	\$ 2,380.00
1	Farmer Stock Peanut Cleaner	\$ 5,000.00
1	Seed Treater	\$ 2,500.00
2	Surge Bins	\$ 1,600.00
1	Bag Closer	\$ 600.00
-	Misc. Supplies	\$ 300.00
1	Generator (30 Kw.)	\$ 8,000.00
Sub-Total		\$26,070.00
^{1/} Estimated, FOB Supplier		

APPENDIX 6.

EQUIPMENT AND SUPPLIES FOR SARIA (A)^{1/}

No. Req'd.	ITEM	COST ^{2/}
1	Bag Conveyor	\$ 1,000.00
1	Blower	\$ 200.00
1	Vacuum	\$ 550.00
6	Aluminum Baskets	\$ 45.00
1	Platform Scales	\$ 330.00
2	Shovel (scoop)	\$ 36.00
1	Gram Scales	\$ 104.00
1	Moisture Tester	\$ 800.00
4	Bag Trucks	\$ 440.00
2,000	Wire Ties	\$ 30.00
2	Twisters	\$ 30.00
2	Hand Scoops	\$ 15.00
6	Sample Pans, Round	\$ 10.00
1	Seed Trier	\$ 30.00
1	Grain Scale with Weight Set	\$ 920.00
2	Maize Sheller (hand)	\$ 80.00
-	Replacement Parts for Heid Cleaner & Cyl.	\$ 800.00
-	Misc. Supplies (brooms, string, tools, etc.)	\$ 400.00
1	Generator (9 Kw.)	\$ 4,000.00
	Sub-Total	\$ 9,820.00

^{1/}Applicable if Austrian Government
equipment offer is accepted

^{2/}Estimated, FOB Supplier

APPENDIX 7.

EQUIPMENT AND SUPPLIES FOR SARIA (B)^{1/}

No. Req'd.	ITEM	COST ^{2/}
1	Elevator Assembly	\$ 2,500.00
1	Cleaner Assembly	\$11,000.00
1	Elevator Assembly	\$ 2,000.00
2	Surge Bins (with frames)	\$ 1,600.00
1	Gravity Table (with support frame)	\$ 4,800.00
1	Vibrator Conveyor (with support frame)	\$ 900.00
1	Elevator Assembly	\$ 2,000.00
1	Surge Bin (with support frame)	\$ 800.00
1	Seed Treater (with support frame)	\$ 2,100.00
1	Elevator Assembly	\$ 1,400.00
1	Surge Bin (with support frame)	\$ 800.00
1	Bagger-Weigher	\$ 900.00
1	Bag Closer	\$ 600.00
1*	Bag Conveyor	\$ 1,000.00
1*	Blower	\$ 200.00
1*	Vacuum	\$ 550.00
6*	Aluminum Baskets	\$ 45.00
1*	Platform Scales	\$ 330.00
2*	Shovel (scoop)	\$ 36.00
1*	Gram Scales	\$ 104.00
1*	Moisture Tester	\$ 800.00
4*	Bag Trucks	\$ 440.00
2,000*	Wire Ties	\$ 30.00

APPENDIX 7. (cont.)

No. Req'd.	ITEM	COST ^{2/}
2*	Twisters	\$ 30.00
2*	Hand Scoops	\$ 15.00
6*	Sample Pans, Round	\$ 10.00
1*	Seed Trier	\$ 30.00
1*	Grain Scale with Weight Set	\$ 920.00
2*	Maize Sheller (hand)	\$ 80.00
---*	Misc. Supplies (brooms, string, tools, etc.)	\$ 400.00
1	Generator (30 Kw.)	\$ 8,000.00

Sub-Total \$44,420.00

^{1/} Applicable if Austrian Government
equipment offer is rejected

^{2/} Estimated, FOB Supplier

* Items included in Appendix 6

APPENDIX 8.

EQUIPMENT AND SUPPLIES FOR MOGTEDO

No. Req'd.	ITEM	COST ^{1/}
1	Bagger-Weigher	\$ 900.00
1	Blower	\$ 200.00
6	Aluminum Baskets	\$ 45.00
1	Platform Scales	\$ 330.00
2	Shovel (scoop)	\$ 36.00
1	Gram Scales	\$ 104.00
1	Seed Trier	\$ 30.00
1	Moisture Tester	\$ 800.00
2,000	Wire Ties	\$ 30.00
2	Twisters	\$ 30.00
6	Sample Pans, Round	\$ 10.00
2	Bag Trucks	\$ 440.00
2	Hand Scoops	\$ 15.00
---	Replacement parts for Colombini Cleaner	\$ 200.00
---	Misc. Supplies (brooms, string, tools, etc.)	\$ 300.00
1	Generator (9 Kw.)	\$ 4,000.00
1	Bag Closer	\$ 600.00
2	Maize Sheller (hand)	\$ 80.00

^{1/}Estimated, FOB Supplier

Sub-Total \$ 8,150.00

APPENDIX 9.

SUMMARY OF EQUIPMENT AND SUPPLIES
RECOMMENDED FOR PURCHASE
(All Locations)^{1/}

ITEM ^{2/} NO.	ITEM	NO. REQ'D.	(EXTENSION) ^{3/} COST (\$ U.S.)
1	Seed Divider	1	\$ 240.00
2	Gram Scales	7	735.00
3	Torsion Balance With Class "P" Weight Set	2	830.00
4	Purity Workboards	2	120.00
5	Desk Lamps	3	300.00
6	Triplex Magnifiers	2	40.00
7	Forceps, Coarse Point	1 doz.	35.00
8	Forceps, Fine Point	1 doz.	40.00
9	Grain Sample Box (1 qt.)	25	30.00
10	Grain Sample Box (1 pt.)	24	25.00
11	Hand Screens (24 screens)	1 set	230.00
12	Seed Blower (South Dakota)	1	830.00
13	Sample Pans, Triangular	6	40.00
14	Sample Pans, Round	3 doz.	60.00
15	Sample Pans, Spout Type	6	50.00
16	Spear Envelopes (8 oz.)	1,000	50.00
17	Spear Envelopes (12 oz.)	2,000	120.00
18	Crispers With Covers (plastic)	72	120.00
19	Germination Towels (10,000 sheets)	20 reams	150.00
20	Germination Blotters (2,500 sheets)	5 reams	420.00
21	Germinators	6	3,300.00
22	Thermometers	2 doz.	120.00

APPENDIX 9. (cont.)

ITEM ^{2/} NO.	ITEM	NO. REQ'D.	(EXTENSION) ^{3/} COST (\$ U.S.)
23	Seed Triers	3	\$ 90.00
24	Seed Triers	4	120.00
25	Seed Oven	1	500.00
26	Moisture Testers	6	4,800.00
27	Sling Psychrometer	3	105.00
28	Petri Dishes	100	20.00
29	Filter Paper (100/pkg.)	20 pkgs.	30.00
30	Binocular Microscope	1	600.00
31	Platform Scales	6	1,980.00
32	Wire Ties (5,000/roll)	2 rolls	60.00
33	Twisters	12	180.00
34	Bag Trucks	20	2,200.00
35	Shovel (scoops)	12	216.00
36	Bag (heat sealer)	1	630.00
37	Bag Closer	5	3,000.00
38	Bag Needles	4 doz.	35.00
39	Grain Scale With Weight Set	3	2,760.00
40	Hand Scoops	12	90.00
41	Aluminum Baskets	3 doz.	270.00
42	Bag Conveyors	5	5,000.00
43	Bagger-Weigher	4	3,600.00
44	Industrial Vacuum	4	2,200.00
45	Blower (Tornado)	5	1,000.00
46a	Maize Sheller	6	240.00

APPENDIX 9. (cont.)

ITEM ^{2/} NO.	ITEM	NO. REQ'D.	(EXTENSION) ^{3/} COST (\$ U.S.)
46b	Maize Sheller (alternative)	3	\$ ----
47	Elevator Assembly *(1-Ouaga; 2-Niangoloko)	3*	3,570.00
48	Seed Treater (Ouagadougou)	1	1,600.00
49	Elevator Assembly (Niangoloko)	1	1,200.00
50	Farmer Stock Peanut Cleaner	1	5,000.00
51	Seed Treater (peanuts in shell)	1	2,500.00
52	Generator (9 Kw.) *(Ouaga; Kamboinese; Valle do Kou; Saria and Mogtedo)	5*	20,000.00
53	Generator (30 Kw.) (Niangoloko)	1	8,000.00
54	Surge Bins *(1-Ouaga; 2-Niangoloko)	3*	2,400.00
55	Parts for Colombine Equipment (Kamboinese and Mogtedo)	---	2,000.00
56	Parts for Heid Equipment	---	800.00
57	Seed Fumigant	1 case	1,000.00
58	Seed Treatment (fungicide) (100lbs/drum)	4 drums	800.00
59	Poly-Bag Maker Tubing (800 ft./roll)	2 rolls	100.00
60	Polyethelene Film Sheeting (100 ft./roll)	2 rolls	250.00
61	Misc. Supplies	---	2,900.00

^{1/} Assumption made that Austrian equipment offer is accepted.

^{2/} Cross reference to item numbers in Appendix 10.

^{3/} Estimated, FOB Suppliers

TOTAL	\$89,731.00
(15% price increase)	13,460.00
(40% crating & shipping)	41,270.00
(CIF Port of Entry)	\$144,461.00

APPENDIX 10.

EQUIPMENT SPECIFICATIONS FOR ALL LOCATIONS^{1/}

ITEM ^{2/} NO.	DESCRIPTION
1	Seed Divider, similar or equal to Official Boerner Sampler No. 344. Made of brass and copper; height approximately 31 inches (79 cm); complete with two pans. Supplier: B,F,T (See Supplier Index)
2	Gram Scales with weigh beams calibrated as follows: (front) 10 x 0.1g; (rear) 100 x 10g; (center) 5000 x 100g. Complete with scoop. Similar to Burrows Model 1332. Supplier: B,T (See Supplier Index)
3	DLM2-1 Torsion Balance Scale; capacity 120g.; dial 1.0g. x .01g. graduation; readability 2 mg.; accuracy 5 mg. with polished steel scope, positive acting arrest; silicone fluid dash pots and metal case. Complete with Class P stainless weight set (50 gm. to 1g. in hinged box with forceps). Supplier: B,T (See Supplier Index)
4	Purity Work Board. Similar to Seedburo Model No. 135. Supplier: B,T (See Supplier Index)
5	Desk Lamps. Similar to Seedburo Model No. P-2324. Complete with 24 extra bulbs. Operable on 220 volt, 50 hz. current. Supplier: B,T (See Supplier Index)
6	Triplet Magnifiers. Power 20 x; lens diameter 8mm; focus 1/2". Similar to Seedburo No. 193A. Supplier: B,T (See Supplier Index)
7	Forceps. Nickel plated, 5-1/2" long, medium serrated point. Similar to Seedburo No. 59. Supplier: B,T (See Supplier Index)
8	Forceps. Nickel plated, 5" long, fine smooth point. Similar to Seedburo No. 00B Supplier: B,T (See Supplier Index)
9	Grain Sample Bottle. Polyethylene, with metal cap and gasket insert for airtight seal; quart size. Similar to Burrows No. 367. Supplier: B,T (See Supplier Index)
10	Grain Sample Bottle. Polyethylene, with metal cap and gasket insert for airtight seal; pint size. Similar to Burrows No. 368. Supplier: B,T (See Supplier Index)

APPENDIX 10. (cont.)

ITEM ^{2/} NO.	DESCRIPTION
11	Hand screens. Set of twenty-four (24) screens, 22.8cm x 22.8cm (9 x 9 inchi), complete with screen rack. Screens to be sized as follows: (U.S. sizes) <u>Round Hole:</u> 1/16, 6,7,8,10,12,14,16,20,24,30, 1/14, 1/20. <u>Slotted:</u> 1/12 x 1/2, 1/14 x 1/2, 1/15 x 1/2, 3 x 5/16, 7 x 3/4, 8 x 3/4, 9 x 3/4, 10 x 3/4, 11 x 3/4 <u>Wire Mesh:</u> 20 x 20, 6 x 24 Supplier: B,G,T (See Supplier Index)
12	South Dakota Seed Blower, Model B, complete with Column No. 1, 3" diameter and extension section, and Column No. 1 of 1/2" diameter. Operational on 220 volts, 50 hz., 1 phase current. Supplier: B,F,T (See Supplier Index)
13	Sample (grain) Pan. Triangular, heavy tin, dark blue enamel, 10" x 10" x 2-1/2". Similar to Burrows No. 304. Supplier: B,T (See Supplier Index)
14	Sample (grain) Pan. Round, tin plate metal, 2 qt. capacity, 8-3/4" diameter x 2-3/4" deep. Similar to Burrows No. 341. Supplier: B,T (See Supplier Index)
15	Sample (grain) Pan. Spout type, aluminum, 1-1/2 qt. capacity. Similar to Burrows No. 301. Supplier: B,T (See Supplier Index)
16	Spear Grain Envelopes, 8 oz., 5 x 8. Supplier: J (See Supplier Index)
17	Spear Grain Envelopes, 12 oz., 6 x 10. Supplier: J (See Supplier Index)
18	Crispers, plastic with covers, 9" x 12-1/4" x 4-1/8". Similar to Tri-State No. 295F. Supplier: V (See Supplier Index)
19	Germination towels, 10" x 15". Supplier: A,D (See Supplier Index)
20	Germination blotters, 19" x 24" steel blue, cut to 6" x 12". Supplier: A (See Supplier Index)

APPENDIX 10. (cont.)

ITEM ^{2/} NO.	DESCRIPTION
21	Germinator, approximately O.A. dimensions: 19" width x 12" depth x 20" height. Fully automatic with moisture pan and fresh air chamber, insulated rust proof cabinet and thermopane plexiglass door. Containing: four (4) Dur-Aluminum trays, dial thermometer, strip heaters. Similar to Burrows Model 1880 germinator. Operational on 220 volts, 50 hz., 1 phase current. Supplier: B,T (See Supplier Index)
22	Thermometers. General laboratory type, Range -20 to 110 degrees Centigrade; subdivisions 1 C; length 305 mm. Similar to Sargent - Welch Scientific Company No.S-80005B. Supplier: R,S (See Supplier Index)
23	Bag trier, 1M (39 inch) length, 25 cm (7/8 inch) outside diameter, double tube, six openings. Similar to Burrows No. 536. Supplier: B,T (See Supplier Index)
24	Bag trier, 76.2 cm (30 inch) length, 1.2 cm (1/2 inch) outside diameter, double tube, 9 openings. Similar to Burrows No. 530. Supplier: B,T (See Supplier Index)
25	Oven, stainless steel, similar to Cenco Stainless Steel Oven No. 262. Temperature range to 213 C (425 F.). Min. two inches of high density fiberglass insulation completely surrounds the inner chamber (including door). Air intake valves at both sides of the chamber, near the bottom; a metal damper on the top of the oven for control of the air circulation; provision for the mounting of the thermometers to measure inside temperatures; all aluminum-clad steel int. (not painted); heavy guage steel ext. w/hammerloid finish. Dimension, inside chamber (approximately) 18" w. x 14" d. x 14" h. Three shelves, 2 adjustable, operational on 220 volts, 50 hz. 1 phase current. Supplier: B,T (See Supplier Index)
26	Seed Moisture Tester, portable, complete with all charts. Similar to Burrows Universal Moisture Tester Model EH. Supplier: B,T (See Supplier Index)
27	Sling psychrometer, w/six extra thermometer and package of extra wicks. Supplier: B,T,U (See Supplier Index)
28	Petri dishes, plastic, 6" (15.2 cm) diameter, 1" (2.54cm) deep. Similar to Tri-State No. 170. Supplier: B,T,V (See Supplier Index)
29	Filter paper, Whatman No. 1; 15.0cm diameter, size G. Similar to Sargent-Welch No. S-33215. Supplier: R,S (See Supplier Index)

APPENDIX 10. (cont.)

ITEM ^{2/} NO.	DESCRIPTION
40	Cast aluminum scoop, 5-3/4" x 10-1/2" bowl measurement. Similar to Burrows No. 1724. Supplier: B,T (See Supplier Index)
41	Aluminum baskets, 1 bushel size. Similar to Burrows No. 1724. Supplier: B,T (See Supplier Index)
42	Bag conveyor, similar to Burrows Model R-19-3/4 HE with RUC-19 under-carriage. Aluminum bag conveyor, 5.8 M (19 ft.) length with 300 lb. distributed load (75 Kg. unit load) capacity. Complete with start-stop and reverse switch controls and motor operation on 220 volt, 50 hz., 1 phase current. Supplier: B,T (See Supplier Index)
43	Gross bagger-weigher, automatic, all mechanical operation, calibrated in metric units of measurement. Bagging scale to handle 11 Kg. to 100 Kg. open mouth paper, textile or plastic bags. Bag spout to accommodate bags up to 1.30 meter circumference. Complete with floor support stand. Similar to Howe-Richardson Model G-17 automatic scale. Supplier: B,L,T (See Supplier Index)
44	Vacuum Cleaner, industrial type, portable. Complete with dust bag; blower nozzle; hose connector; 4m (13 ft.) of 5.0 cm (2 inch) diameter hose; operational on 220 volt, 50 hz., 1 phase current. Similar to Tornado Model 430. Supplier: B,I,T (See Supplier Index)
45	Blower, portable. Complete with nozzle and operational on 220 volt, 50 hz., 1 phase current. Similar to Tornado Model 850. Supplier: B,T (See Supplier Index)
46a	Maize sheller, hand operated, capacity up to 200 Kg./hour. Made of heavy cast iron. Similar to Burrows No. 1415. Supplier: B,T (See Supplier Index)
46b	Maize sheller, gasoline engine powered, capacity 400-800 Kg./hour. Complete with engine and drive belts. Similar to Yamamoto Corn Sheller type YC-800. Supplier: Yamamoto Mfg. Co., Ltd., Tendo-City, Yamagata, Japan
47	Belt-bucket elevator, self supporting, similar to Universal Model C2-175 "Easy Dump". Elevator to have 5 ton (175 BPH) per hour capacity, (seed at 48 lbs./cu.ft.) @ 75% bucket filling and 110-125 (FPM) belt speed. Discharge height to be 4.0M (13 ft.); O.A. height not to exceed 5.0M (16 ft.). Complete with the following: a. required buckets, splicing, pre-punched belting and assembling hardware.

APPENDIX 10. (cont.)

ITEM ^{2/} NO.	DESCRIPTION
	<ul style="list-style-type: none"> b. spacers for insertion between belt and buckets (washer type) c. dump hopper. d. 15.2 cm (6-inch) dia. adjustable elbow with clamp rings (transitions included). e. One (1) 3.0M (10 ft.) section 15.2cm (6-inch) 14 ga. flanged rigid spouting. f. One (1) clamp ring (for connecting elbow to spouting). g. Manufacturers recommended drive and (TEBB) motor of required horsepower operational on 220 volt, 50 hz. 1 phase current. h. replacement parts not to exceed \$100. Supplier: B,N,T,W (See Supplier Index)
48	<p>Seed Treater, similar to Gustafson Model XL. Treater to have 4.5 ton per hour capacity (150 BPH) and capability of applying dust type seed treatment products. Complete with dust evacuator, 2-way bagging attachment drives and motor of required horsepower, operational on 220 volt, 50 hz., 1 phase current. Manufacturer to supply replacement parts not to exceed \$100. Supplier: B,I,N,T (See Supplier Index)</p>
49	<p>Belt-bucket elevator, self-supporting, similar to Universal Model C2-175 "Easy Dump". Elevator to have 5 ton (175 BPH) per hour capacity, (seed at 48 lbs./cu.ft.) @ 75% bucket filling and 110-125 (FPM) belt speed. Discharge height to be 5.1M (17 ft.); O.A. height not to exceed 6.0M (20 ft.). Complete with the following:</p> <ul style="list-style-type: none"> a. required buckets, splicing, pre-punched belting and assembling hardware. b. spacers for insertion between belt and buckets (washer type). c. dump hopper. d. 15.2 cm (6-inch) dia. adjustable elbow with clamp rings (transitions included). e. Two (2) 3.0M (10 ft.) section 15.2cm (6-inch) 14 ga. flanged rigid spouting. f. Six (6) clamp ring (for connecting elbow to spouting). g. Manufacturers recommended drive and (TEBB) motor of required horsepower operational on 220 volt, 50 hz., 1 phase current.

APPENDIX 10. (cont.)

ITEM ^{2/} NO.	DESCRIPTION
	<p>h. replacement parts not to exceed \$100. Supplier: B,N,T,W (See Supplier Index)</p>
50	<p>Farmer Stock Peanut Cleaner. Similar to Hobbs Model 403 Polyphase Cleaner. Equipped with separate systems to: separate taproot, hay, sticks and similar chaff; separate hulls, pops, light organic matter and other materials with relatively low specific gravity; separate dirt, gravel, splits loose shelled kernels or other material smaller than final product. Complete with: machine driven variable flow feeder and stoner attachments; screening finger assemblies (set of 2); mounting stand 39" (1M) high; all drives and motor operational on 380 volt, 50 hz., 3 phase current; replacement parts not to exceed \$300. NOTE: Customer to supply dust cyclone and ducting. Supplier: K (See Supplier Index)</p>
51	<p>Seed Treater (for peanuts in the shell). Drum type treater (special order) modified Gustafson XL treater. Treater to have capacity of applying dust type seed treatment products. Complete with dust evacuator; replacement parts not to exceed \$100; drives and motor operational on 220 volt, 50 hz., 1 phase current. Supplier: I (See Supplier Index)</p>
52.	<p>Generator, diesel fuel, rated for 9 Kw. (continuous operation); with output power of 220/380 volts, 50 hz., 1 phase and 380 volts, 3 phase A.C. current. Complete with muffler, fuel lines and controls. ONAN Model 9.0 DJC-518R or similar. Supplier: P (See Supplier Index)</p>
53.	<p>Generator, diesel fuel, rated for 30 Kw. (continuous operation); with output power of 220/380 volts, 50 hz., 1 phase and 380 volts, 3 phase A.C. current. Complete with muffler, fuel lines and controls. ONAN Model 30.3 DDA-15R or similar. Supplier: P (See Supplier Index)</p>
54	<p>Surge bin, sheet metal, approximately 1.5M x 1.5M x 1.5M hoppers-bottom with support stand. Supplier: Local Fabrication</p>
55	<p>Parts for Colombine equipment. Needs to be determined locally through correspondence with Colombini.</p>
56	<p>Parts for Heid equipment. Needs to be determined locally through correspondence with Heid.</p>
57	<p>Seed fumigant, pellets. Degesch "Phostoxin" or similar. Supplier: Q. (See Supplier Index)</p>

APPENDIX 10. (cont.)

ITEM ^{2/} NO.	DESCRIPTION
58	Seed treatment (fungicide), formulated for application as dry dust. Dupont Co. Arasan 50 Red (50% Thiram) or similar. Supplier: E (See Supplier Index)
59	Poly-Bag-Maker Tubing, clear, seamless, "Lay-flat" polyethylene tubing designed for use with heat sealing equipment. Tubing to be 6 mil thickness, 12" wide. Similar to McMaster-Carr No. 2062Y64 (catalog 80). Supplier: M (See Supplier Index)
60	Polyethylene film sheeting, clear, 6 mil thickness. Rolls to be 14 ft. (width) x 100 ft. (length). Similar to McMaster-Carr No. 8553K18 (catalog 80). Supplier: M (See Supplier Index)
61	Miscellaneous supplies for testing laboratory and multiplication stations (maintenance supplies, electric plugs, switches, tools, etc.) Local Purchases

^{1/} Assumption made that Austrian equipment offer accepted.

^{2/} Cross referenced to item numbers in Appendix 9.

APPENDIX 11.

SPECIFICATIONS FOR ADDITIONAL
EQUIPMENT REQUIRED (SARIA)
IF AUSTRIAN EQUIPMENT OFFER
IS REJECTED

ITEM NO.	DESCRIPTION	NO. REQ'D.
1	Surge bin, sheet metal, oven seed cleaner; 1.5 x 1.5 x 1.5 m hopped-bottom, floor supported. Estimated Cost: \$1,000.00 Local Fabrication	1
2	Air-screen cleaner; three screen, similar to Crippen model NW334 cleaner. Cleaner to have independent upper and lower air systems; synchronized brush type screen wipers; adjustable speed shake; screen frame size of 86.3 cm x 1.12 m (34 x 44 inches). O.A. cleaner frame dimensions: 1.12 m (44 inches) width x 2.99 m (118 in.) length x 1.9 m (75 inches) height. Average capacity (seed) 1.9 ton (75 BPH) per hour. Complete with following: <ul style="list-style-type: none"> a. replacement parts not to exceed \$200. b. roll-feed (type A) hopper. c. fans mounted 45 degree angle to rear. d. fan outlets to have square to round (30.4 cm) dia. adaptors. e. waste product discharge outlets on <u>left</u> side; clean seed vibrating conveyor discharge outlet on <u>right</u> side. f. waste product bag holders. g. base support framing (steel) 1 m (39 inches) high. h. two (2) 30 x 60 dust cyclones, one for clockwise and one for counter-clockwise rotation. Complete with square to round adaptors (for indoor installation). i. manufacturer's recommended drives, guards, motor mounting and TEFC motor of required horsepower operational on 380 volt, 50 hz., 3 phase current. j. twenty-four (24) screens sized as follows: 	1

APPENDIX 11. (cont.)

ITEM NO.	DESCRIPTION	NO. REQ'D.
	<p><u>Round hole:</u> 28, 26, 24, 22, 20, 18, 16, 14, 12, 10, 8, 6.</p> <p><u>Slotted:</u> 13 x 3/4, 11 x 3/4, 10 x 3/4, 9 x 3/4, 8 x 3/4, 7 x 3/4, 6 x 3/4, 5 x 3/4, 1/16 x 1/2, 1/15 x 1/2, 1/14 x 1/2, 1/13 x 1/2.</p> <p>Estimated Cost, FOB Supplier \$11,000.00 Supplier: C,N (See Supplier Index)</p>	
3	<p>Belt-bucket elevator, self supporting, similar to Universal Model C2-175 "Easy Dump". Elevator to have 5 ton (175 BPH) per hour capacity, (seed at 48 lbs./cu.ft.) @ 75% bucket filling and 110-125 (FPM) belt speed. Discharge height to be 6.7 m (22 ft.); O.A.H. not to exceed 7.7 m (25 ft.). Complete with the following:</p> <ol style="list-style-type: none"> required buckets, splicing, pre-punched belting and assembling hardware. spacers for insertion between belt and buckets (washer type). dump hopper. 15.2 cm (6-inch) dia. adjustable elbow with clamp rings (transitions included). one (1) 3.0 m (10 ft.) section 15.2 cm (6-inch) 14 ga. flanged rigid spouting. manufacturers recommended drive and (TEBB) motor of required horsepower operational 220 volt, 50 hz., 1 phase current. <p>Estimated Cost, FOB Supplier \$2,000.00 Supplier: B,N,T,W (See Supplier Index)</p>	1
4	<p>Belt-bucket elevator, self supporting similar to Universal Model C2-175 "Easy Dump". Elevator to have 5 ton (175 BPH) per hour capacity, (seed at 48 lbs./cu.ft.) at 75% bucket filling and 110-125 (FPM) belt speed. Discharge height to be 7.6 m (25 ft.); O.A. height not to exceed 8.6 m (28 ft.). Complete with the following:</p> <ol style="list-style-type: none"> required buckets, splicing, pre-punched belting and assembling hardware. spacers for insertion between belt and buckets (washer type). 	

ITEM NO.	DESCRIPTION	NO. REQ'D.
	<ul style="list-style-type: none"> c. dump hopper. d. two-way valve with 15.2 cm (6-inch). e. two (2) 15.2 cm (6-inch) dia. adjustable elbows with clamp rings. f. two (2) 15.2 cm (6-inch) dia. loose flanges. g. four (4) clamp rings. h. three (3) 3.0 m (10 ft.) section 15.2 cm (6-inch) dia. 14 ga. flanged rigid spouting. i. manufacturers recommended drive and motor of required horsepower operational on 220 volt, 50 hz., 1 phase current. <p>Estimated Cost, FOB Supplier \$2,500.00 Supplier: B,N,T,W (See Supplier Index)</p>	
5	<p>Surge bin, sheet metal, over gravity table; 1.5 x 1.5 x 1.5 m hoppers-bottom, floor supported.</p> <p>Estimated Cost: \$800,00 Local Fabrication</p>	1
6	<p>Gravity Table, similar to Oliver Model 80, operating capacity of approx. 2,500 lbs. per hour (medium-large size seed); rectangular deck, three (3) fans; <u>left-hand</u> discharge. Complete with the following:</p> <ul style="list-style-type: none"> a. non-reciprocating discharge spouts. b. air-filter screens. c. screen wire deck (Type A). d. manual starter. e. extra set of drive belts. f. manufacturer's recommended drive and motor of required horsepower operational on 380 volt, 50 hz. 3 phase current. <p>Estimated Cost, FOB Supplier \$3,100.00 Note: Customer to provide support frame. Supplier: N,O (See Supplier Index)</p>	1
7	<p>Vibrator conveyor for No. 7 (A.T. Ferrell) cleaner with 1/3 hp motor operational on 220 volt, 50 hz., 1 phase current.</p>	1

ITEM NO.	DESCRIPTION	NO. REQ'D.
	<p>Estimated Cost, FOB Supplier \$700.00 <u>Note:</u> Customer to provide support frame. Supplier: C (See Supplier Index)</p>	
8	<p>Belt-bucket elevator, self supporting, similar to Universal Model C2-175 "Easy Dump". Elevator to have 5 ton (175 BPH) per hour capacity, (seed at 48 lbs./cu. ft.) at 75% bucket filling and 110-125 (FPM) belt speed.. Discharge height to be 6.7 m (22 ft.); O.A. height not to exceed 7.7m (25 ft.). Complete with the following:</p> <ul style="list-style-type: none"> a. required buckets, splicing, pre-punched belting and assembling hardware. b. spacers for insertion between belt and buckets (washer type). c. dump hopper. d. two-way valve with 15.2 cm (6-inch) dia. outlets. e. two (2) 15.2 cm (6-inch) dia. adjustable elbows with clamp rings. f. one (1) 3.0 m (10 ft.) section 15.2 cm. (6-inch) dia. 14 ga. flanged rigid spouting. g. manufacturers recommended drive and TEBB motor of required horsepower operational on 220 volt; 50 hz., 1 phase current. <p>Estimated Cost, FOB Supplier \$1,400.00 Supplier: B,N,T, (See Supplier Index)</p>	1
9	<p>Surge bin, sheet metal, oven seed treater; 1.5 x 1.5 x 1.5 m hoppers-bottom, floor supported.</p> <p style="text-align: right;">Estimated Cost: \$800.00 Local Fabrication</p>	1
10	<p>Seed Treater, similar to Gustafson Model B. Treater to have 4.5 ton (150 BPH) per hour capacity and capability of applying both liquid and wettable powder formulated products. Complete with drive and motor of required horsepower operational on 220 volt, 50 hz., 1 phase current and extra set of drive belts.</p> <p>Estimated Cost, FOB Supplier \$1,800.00 <u>Note:</u> Customer to provide support frame. Supplier: B,I,N,T (See Supplier Index)</p>	1

ITEM NO.	DESCRIPTION	NO. REQ'D.
11	<p>Belt-bucket elevator, self supporting, similar to Universal Model C2-175 "Easy Dump". Elevator to have 5 ton (175 BPH) per hour capacity, (seed at 48 lbs./cu. ft.) at 75% bucket filling and 110-125 (FPM) belt speed. Discharge height to be 6.0 m (20 ft.); O.A. height not to exceed 7.0 m (23 ft.). Complete with the following:</p> <ul style="list-style-type: none"> a. required buckets, splicing, pre-punched belting and assembling hardware. b. spacers for insertion between belt and buckets. c. dump hopper. d. one (1) 15.2 cm (6-inch) dia. adjustable elbow with clamp rings. e. manufacturer's recommended drive and TEBB motor of required horsepower operational on 220 volt, 50 hz., 1 phase current. <p>Estimated Cost, FOB Supplier \$1,400.00 Supplier: B,N,T,W (See Supplier Index)</p>	1
12	<p>Surge bin, sheet metal, over bagger-weigher; 1.5 x 1.5 x 1.5 m hoppers-bottom, floor supported.</p> <p>Estimated Cost: \$800.00 Local Fabrication</p>	1
13	<p>Bagging scale, semi-automatic, similar to Howe-Richardson Model G-17. Complete with: bag tare device; flow control inlet gate; calibrated weigh-beam; graduated over-under weight indicator; weight range, 25-100 kgs. quick bag release and mounting attachments for mounting unit to underside of metal bin equipped with 10.0 cm (4-inch) discharge outlet.</p> <p>Estimated Cost, FOB Supplier \$900.00 Supplier: B,L,T (See Supplier Index)</p>	1
14	<p>Bag closer, portable, single thread similar to Fischbein Model D. Bag closer to have direct drive motor operational on 220 volt; 50 hz., 1 phase current. Complete with one (1) carton (32 cones) 8 ounce thread and replacement part kit for one year operation.</p> <p>Estimated Cost, FOB Supplier \$600.00 Supplier: B,H,T (See Supplier Index)</p>	1

ITEM NO.	DESCRIPTION	NO. REQ'D.
15	Generator, diesel fuel, rated for 30 kw. (continuous operation); with output power of 220/380 volts, 50 hz., 1 phase and 380 volts, 3 phase A.C. current. Complete with muffler, fuel lines and controls. ONAN Model 30.3 DDA-15R or similar.	1
	Estimated Cost, FOB Supplier \$8,000.00 Supplier: P (See Supplier Index)	
16	Seed treatment fungicide, wettable powder formulation. Dupont Company Arasan-70 or similar.	
	Estimated Cost, FOB Supplier \$200.00 for 1 drum (100 lbs.) Supplier: E (See Supplier Index)	

GRAND TOTAL OF EQUIPMENT, FOB SUPPLIERS = \$37,000.00
 (15% inflation in prices) = 5,550.00
 (40% crating and shipping) = 17,020.00

CIF (Port of Entry) \$59,570.00

APPENDIX 12.

SUPPLIER INDEX

Companies listed below are potential suppliers of the items shown in "Equipment Specification" list. The referenced items may be available from sources in addition to those listed.

INDEX IDENTIFICATION	SUPPLIER
A.	Anchor Paper Company 430 Broadway St. Paul, Minnesota 55101 U.S.A.
B.	Burrows Equipment Company 1316 Sherman Avenue Evanston, Illinois 60204 U.S.A.
C.	Crippen Manufacturing Company Alma, Michigan 48801 U.S.A.
D.	Dillard Paper Company 200 Peters Street, Southwest Atlanta, Georgia 30300 U.S.A.
E.	E.I. Dupont de Nemours & Company Biochemical Department Wilmington, Delaware 19898 U.S.A.
F.	E.L. Erickson Products Brookings, South Dakota 57006 U.S.A.
G.	Ferrell-Ross Drawer 26468 Oklahoma City, Oklahoma 73126 U.S.A.
H.	Fischbein Company 1700 - 30th Avenue, South Minneapolis, Minnesota 55405 U.S.A.
I.	Gustafson Manufacturing Company 6600 S. County Road 18 Hopkins, Minnesota U.S.A.
J.	Heinrich Envelope Company 925 Lane Avenue North Minneapolis, Minnesota 55422 U.S.A.

INDEX IDENTIFICATION	SUPPLIER
K.	Hobbs-Adams Engineering Company 1100 Holland Road P.O. Box 1833 Suffolk, Virginia 23434 U.S.A.
L.	Howe-Richardson Scale Company 680 Van Houten Avenue Clifton, New Jersey 07000 U.S.A.
M.	McMaster-Carr Supply Company P.O. Box 4355 Chicago, Illinois 60680 U.S.A.
N.	Mercator Corporation P.O. Box 142 Reading, Pennsylvania 19600 U.S.A.
O.	Oliver Manufacturing Company Rocky Ford, Colorado 81067 U.S.A.
P.	ONAN Corporation International Sales 1400 73rd Avenue, Northeast Minneapolis, Minnesota 55432 U.S.A.
Q.	Phostoxin Sales, Inc. 2221 Poplar Boulevard Alhambra, California 91800 U.S.A.
R.	Sargent-Welch Scientific Company 5915 Peeler Street Dallas, Texas 75235 U.S.A.
S.	Scientific Products 1210 Leon Place Evanston, Illinois 60200 U.S.A.
T.	Seedburo Equipment Company 1022 West Jackson Boulevard Chicago, Illinois 60607 U.S.A.
U.	The Harry Alter Company 2399 South Archer Avenue Chicago, Illinois 60616 U.S.A.
V.	Tri-State Plastic Molding Company P.O. Box 337 Henderson, Kentucky 42420 U.S.A.
W.	Universal Industries 516 Grand Boulevard Medar Falls, Iowa 50613 U.S.A.

APPENDIX 13

ITINERARY
G.M. Dougherty

21 September - 20 October, 1975

- | | | | |
|-------------|---|---|---|
| Sept. 21 -- | Leave State College, MS
Arrive Atlanta, GA
(overnight Atlanta) | 1640 hrs.
1930 | SO 81C |
| Sept. 22 -- | Leave Atlanta, GA
Arrive Washington, D.C.
Dept. of State
Leave Washington, D.C.
Arrive New York JFK via LaG
Leave New York JFK | 0800
0945
1015-1130
1200
1322
1930 | DL 214

Eastern Shuttle
PA 156 |
| Sept. 23 -- | Arrive Dakar
Leave Dakar
Arrive Ouagadougou
Meeting with Mr. R. Meyer, Manager, Seed Multiplication Project to obtain background information and define assignment objectives. | 0645
0845
1345 | RK 300 |
| Sept. 24 -- | Ouagadougou - Meeting with Madame Rose Marie Sanwidi, Chief, National Seed Service to discuss design plans for seed headquarters building, and visited Kamboinse Seed Multiplication Station to observe equipment and station operations. | | |
| Sept. 25 -- | Ouagadougou - Meeting with Mr. Mario Laure, (PNUD-FAO) Director du Project UPV/72/007, Assistance au Programme de Developement Rural, to discuss Austrian Government equipment proposal. Meeting with Madame Sanwidi to discuss Seed Testing Laboratory equipment items. | | |
| Sept. 26 -- | Ouagadougou - Visited Ouagadougou ORD (Mogtedo) seed processing facility. Meeting with Mr. M.C. Malcoiffe, Deputy Director, IRAT Upper Volta, to discuss equipment installation at Farako-Ba seed multiplication station. | | |
| Sept. 27 -- | Ouagadougou | | |
| Sept. 28 -- | Ouagadougou | | |
| Sept. 29 -- | Ouagadougou - Visited Kamboinse to select probable location site for seed storage warehouse. Discussions with Mr. Frederic M. Bergier, Regional Engineer, REDSO/WA, Abidjan relative to designing structures to be constructed. | | |
| Sept. 30 -- | Ouagadougou - Visited Kamboinese. Discussions with Madame Rose Marie Sanwidi. Meeting with Mr. B. Yonli, Engineer, Direction De L'Hydraulique De L'Amenagement et De L'Espace Rural to discuss building construction costs. Visited ASECNA to obtain climatological data. Discussions with FED personnel relative to building construction costs. | | |

Oct. 20 --	Departed Dakar	0155 hrs.	PA 189
	Arrived New York	0605	
	Leave New York	0930	DL 209
	Arrive Atlanta	1150	
	Leave Atlanta	1250	SO 135
	Arrive GTR (Starkville)	1320 hrs.	