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FIFTH ANNUAL PROGRAM AND  
WORK PLAN REPORT

Contract AID/afr-752  
Contract AID/afr-C-1175

SEED MULTIPLICATION AND DISTRIBUTION  
TANZANIA

February 1976

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# FIFTH ANNUAL PROGRAM AND WORK PLAN REPORT

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## SEED MULTIPLICATION AND DISTRIBUTION - TANZANIA

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### I. INTRODUCTION

The Seed Multiplication Project has now finished its fifth year of operation. To date 14 Experience, Incorporated team members have served the project.

The year was off to a good start. Planting on both farms was done on time, but the lack of moisture made it necessary to replant some seed fields. The Msimba Foundation Seed Farm harvested a good seed crop for the most part. When one sees 65,000 bushels of maize on the cob drying in cribs, one knows it can be done. All of this year's seed crop has been processed and is being distributed by the Tanzania Seed Company to the regions in Tanzania. The lack of moisture at Arusha resulted in some fields being left unharvested and a sort-out of up to 40 percent on other fields. Even under these severe drought conditions, the processed seed was of fair quality.

A part of the Hooseni Sisal Estate, 30 miles west of Dar es Salaam, has been designated as the third foundation seed farm. Plans are to begin clearing the land of sisal and brush and start building houses.

Additional farm equipment arrived during 1975, making the expanded farm operations in 1976 possible. Repair parts for the machines continue to be a problem but diligent work in the mechanical section and a supply of parts by the Experience, Incorporated home office has kept the machines operating at a generally satisfactory rate.

The accomplishments on the project this past year have been due to teamwork within the project and the support from the Ministry and USAID. A sincere thank you goes to each person that has worked on the Seed Multiplication Project this past year.

## II. SUMMARY

Perhaps the most noteworthy accomplishment of 1975 was the harvesting of 65,000 bushels of maize at the Msimba farm, along with soybeans, sorghum, and other minor crops of good germination. Further land clearing last year made 1,750 acres available for planting at Msimba for 1976. The Msimba farm, located near Kilosa, was formerly a sisal plantation.

The Arusha Foundation Seed Farm, eight miles from Arusha, embraces 1,200 acres and further expansion seems unlikely as small holdings surround the farm. However, there is a possibility of adding another farm, 15 miles away, to the operation. Crop yields were limited by drought and manganese deficiency. Some fields had to be replanted and some turned out too poor to warrant harvesting. However, a fair amount of seed was delivered to the Tanzania Seed Company for distribution to growers.

Seed processing equipment received at both farms was set up on a temporary basis. A seed processing plant and a drier building are due to be built at the Msimba farm in 1976; also a processing plant, drying building and seed warehouse at the Arusha farm. A seed testing laboratory and headquarters building will be constructed on the grounds of the University of Dar es Salaam, Morogoro. Temporary quarters for the seed laboratory were set up at the university, where testing of the seed crop has been carried on.

At the Arusha farm a number of senior and junior staff houses have been built and thus housing construction has been pretty well completed at both farms, although a few houses are not yet equipped with all utilities.

Subsidiary legislation under the Seeds Act of 1973 was signed into law in December 1975, providing regulations for the labeling and certification of seeds. Orris Shulstad, seed testing and certification specialist for Experience, Incorporated, spent nearly three months on the project. He assisted in the writing of manuals, the ordering of equipment, and the start of operations at the temporary seed testing laboratory.

Irrigation is planned for a few hundred acres at each of the two existing seed farms, which should help alleviate the problem of uncertain weather conditions.

Although additional machinery and especially spare parts are needed, and some of them are on order, the equipment situation was vastly improved in 1975. No longer was it necessary to rely on borrowed machines for farm operations and transportation.

The training program continues, with more participants returning from universities in the United States and others off for advanced training.

### III. PERSONNEL

At the end of 1975 Experience, Incorporated had five team members in Tanzania: Franklin Fanberg, project coordinator; Sheldon Sandager and Duane Eriksmoen, farm managers; John Wagner and John Short, agro-mechanics. John Davis, procurement and inventory specialist, left the project in August. Orris Shulstad, seed testing and certification specialist, spent about three months on the project, starting in mid-September.

More than 20 Tanzanians served the project during 1975 in supervisory capacities. These include Michael Mashelle, co-project coordinator; Emmanuel J.N. Lujuo and Stephan Werekyasa, co-farm managers; S.B. Mamiro, station manager; Peter Nyassi and Fabyan Shempemba, co-extension specialists.

Additional information on the above personnel and others who served the project is given in Appendix A.

### IV. FOUNDATION SEED FARMS

#### A. Msimba Foundation Seed Farm

##### 1. Background

Msimba Farm was assigned to the project in July 1971. In the 1971-72 season approximately 500 acres were cleared of sisal and planted to seed crops. In 1972-73 an additional 200 acres were cleared and planted. In 1974 about 700 acres were planted and harvested. Another 865 acres were cleared. Thus 1,592 acres were planted the next season. During 1975 an additional 195 acres were cleared of heavy brush, making 1,750 acres available for 1976 crops. A map of land clearing completed is shown in Appendix B, Figure 1.

##### 2. Crop Summary

Rainfall of 24.88 inches during the growing season, recorded at Msimba Station, was adequate. But severe drought occurred after the early planting of maize and before rains began in mid-March. Thus, the first 200 acres of I.C. Maize had to be replanted. Rainfall for the calendar year totalled 30.95 inches. December rains contributed to an excellent subsoil moisture condition.

Cleaning and processing of seed has been completed. Milling maize, which was sorted out at the time of cribbing, totalled about 5,000 bags of 90 kilograms each and remains to be shelled. Maize seed produced is of excellent quality and amounts to 13,850 bags (49,856 bushels).

Sorghum plantings also produced excellent seed, amounting to 2,110 bags. Soybeans and other minor crops--sesame, bullrush millet and rice--accounted for 440 bags. Thus 16,400 bags (1,640 tons) of high quality seed were produced at the farm. Details on crop production are given in Appendix B, Tables 1 and 2. Field plantings are shown in Appendix B, Figure 2.

Crop sales are estimated to total Shs 2,654,213 against expenditures for the farm (not counting capital outlay) of Shs 1,551,408. Details are shown in Appendix D, Table 1.

The use of herbicides to control weeds was extremely beneficial and economical in comparison with hand labor employed at hoeing. Cultivation is difficult if not impossible during rainy periods. Observations at the experimental weed control plot indicate that a combination of applications is most effective. Comelina and grasses were most effectively controlled with pre-emergent Gesaprim 80 percent W.P. at the rate of three-and-a-half pounds per acre, plus 2,4-D 72 percent, half a liter per acre, applied with drop nozzles when the maize is one meter tall. Guinea grass is somewhat resistant to Gesaprim. Permagram did not appear any more effective in controlling grasses.

### 3. Farm Equipment

New units of field equipment were received and put into operation. A serviceability average of 91.5 percent was maintained. Spare parts were still in short supply and there was over-dependence upon a few machines. The inexperience of some operators and mechanics, as well as lack of a standard field service unit, slowed operations. However, these conditions are being corrected and if new equipment and parts arrive on schedule, a serviceability average of 96 percent seems possible for 1976.

An International Harvester 1700 truck was the only new addition to the automotive fleet. This unit was maintained at 95 percent serviceability for 20,000 miles. Jeep Wagoneers, assigned to contract technicians, were kept serviceable above the 99 percent level.

Usage policy and holdover maintenance arrangements with Comworks were the major detriments of the condition of other vehicles. However, the Msimba workshop provided substantial rescue service for this group.

A seed processing system was set up on a temporary basis after much planning and some difficulty in procurement of equipment. It was put into operation in time to handle the 1975 crop and was kept going with a serviceability average of 97 percent. Fifteen machines were involved. See Appendix C for listings of equipment at the Msimba Farm.

#### 4. Farm Machine Shop

Efficiency of the workshop continued to improve with more training of personnel and arrival of equipment and inventory. More tools and parts are on order. In the meantime, work schedules were helped greatly by the requisition of parts and other supplies through the home office of Experience, Incorporated. Local procurement also was employed in times of need.

Procedures and facilities in stock control were effected. Personnel requirements were met with the training of one person and the recruitment of another already competent in control activities.

Inventory and serviceability data are listed in Appendix C.

#### 5. Farm Buildings, Housing and Facilities

When it became apparent that the dryer and seed processing plant would not be ready for the 1975 crop, a steel frame building was constructed with a raised floor, ventilating shaft and sidewalls of wire mesh fencing. Dimensions are 40 x 200 feet. About half the ear corn was cribbed in this structure and it dried down to 12 percent moisture naturally. The rest of the crop was stored in similar makeshift cribs under the sisal factory roof.

Housing for staff and farm village permanent workers is quite adequate. Minor repairs were made on the roofs of two staff houses. Several houses were painted. In the farm village, kitchens were added to the houses, along with general repairs and some painting. Farm labor was donated toward the building of a primary school.

TANESCO installed separate meters and new lines to all staff houses and to the farm workshop and office. A new telephone switchboard was installed in the office with extensions to the workshop and three of the staff houses.

The Land Planning Division, Morogoro, is conducting a topographic survey of the Msimba Farm in anticipation of a study of the feasibility of irrigating some 200 acres.

#### 6. Farm Labor and Training

The farm has 30 government-paid skilled employees listed under operational service. They include vehicle drivers, tractor drivers, mechanics, electricians, carpenters, masons, pump attendants, stores clerk and master roll clerk.

Another complement of 20 workers includes night watchmen, turn boys, and office help. In peak labor seasons contract workers were employed

on a piecework basis. Labor for hand weeding was difficult to obtain. However, adequate numbers were available for harvesting and processing.

In-service training was expanded in 1975. Regular mechanics were given considerable practical training in applied mechanics, electrical installation, equipment fabrication, building construction, and conventional workshop practices.

Mr. Everest, agricultural engineer, was transferred to Msimba for on-the-job training to prepare him for an assignment to the proposed new seed farm at Tanga. A storekeeper completed out-training at Government Stores, Morogoro.

## B. Arusha Foundation Seed Farm

### 1. Background

This farm, located eight miles outside Arusha, was activated early in 1973 with an assigned area of 300 acres. This acreage is part of a larger tract of 2,200 acres, much of it operated by the National Agricultural and Food Corporation (NAFCO) as a coffee plantation and dairy. The farm soil is derived from volcanic ash. The moisture-holding capacity is low and the permeability excessive. Rainfall is limited. Wind and water erosion are hazards. The land slope ranges from two to six percent.

The farm was expanded to 800 acres in January 1974 and subsequently to 1,200 acres in 1975. Further expansion of the area is unlikely as the farm is completely surrounded by numerous small holdings operated by individual farmers. The possibility of annexing a farm 15 miles away was explored. The decision on the annexation has been delayed until perhaps 1977. The proposed area consists of approximately 700 acres, of which 300 to 400 are under surface irrigation.

### 2. Crop Summary

The crop yields were again limited due to drought and manganese deficiency. Maize planting was started on January 23 and continued through March 8 as moisture became available. One hundred acres were replanted because wind and drought destroyed the crop. Wheat was planted from April 4 to 26. The beans were planted on May 1. See Appendix B, Table 5 and Figure 4 for cropping patterns at the Arusha Farm for the years 1974, 1975 and 1976.

The manganese deficiency again greatly reduced wheat production and quality. Manganese purchased in Kenya could not be delivered because of a ban on fertilizer exports from Kenya. Manganese from the United States was delayed on arrival and then couldn't be used for foliar ap-

plication because it was less than five percent soluble. A local commercial channel for the supply of manganese is being sought. See Appendix B, Figure 5 for manganese deficient areas.

All seed was processed on the Crippen cleaner and delivered to the Tanzania Seed Company in Arusha. See Appendix B, Tables 3 and 4 for crop summary.

### 3. Farm Equipment

The arrival of new machinery during the year greatly facilitated farm operations. Equipment added included an eight-ton trailer, mowing machine, forklift, oxyacetylene welding machine, seed cleaner, water tank and five elevators.

An increase in the cost of spare parts has been noticed. Due to the sandy nature of the soil, dual wheels for the tractors and combine are needed. A dual wheel arrangement for the International Harvester 966 tractor was ordered through the Arusha Regional Trading Company. When the wheels arrived, the cost had risen from Shs 16,000 to Shs 29,000. Only the hubs were accepted and the wheels and tires from the Farmall 544 were used. The Farmall 544 failed shortly after planting season due to a faulty flywheel. Repair parts have been supplied by the manufacturer under warranty.

The general lack of spare parts keeps everyone on the farm alert. Spare parts support from the Experience, Incorporated home office has kept several machines operating which would otherwise be inoperable.

The seed processing machinery was temporarily installed in the machine shed thereby displacing the farm machinery which is now stored in the open or under trees. See Appendix C, Tables 4 and 5 for details on the equipment at the Arusha Farm.

### 4. Farm Machine Shop

The machine shop is still in the planning stage. One end of the machine shed has been used for the shop area. However, since harvest, it was so congested with the storage of grain that a service pit was all that could be used for a shop.

A temporary section of the machine shed was designated to be the toolroom. At this writing it has not been enclosed and no shelves built. As a result, the toolroom is still the mechanic's office. A large number of tools are now in use and others have been ordered. For greater efficiency in maintenance, there is a need for such items as an electric grinder, drill press, and arc welder.

A temporary section of the machine shed was designated as the spare parts and storeroom. Again, this has not materialized and all parts are in the mechanic's office.

#### 5. Farm Buildings, Housing, and Facilities

Five senior staff and four junior staff houses have been built and are occupied. The area around the houses has been planted to grass and hedges and citrus trees. Electricity still has not been connected to three of the senior staff and four of the junior staff houses. Details on the building program at Arusha Farm are shown in Appendix C, Table 6.

The water system is complete except for construction of the storage tank and installation of the chlorinator and filter. A flood in the river broke the pipeline causing numerous failures in water supply. Plans are being formulated to extend the pipeline to a spring, removing the hazard of the river.

The seed processing plant, warehouse, and dryer house have been designed and tenders advertised. The tenders should be awarded early in 1976. Materials for fencing have been secured but construction has been delayed.

An irrigation system was designed for 200 acres, utilizing water from the river and boreholes. The design was submitted to an irrigation supplier for a price quotation. Money for irrigation development has been loaned to the Tanzanian Government by USAID. An application has been made to extract water from the river. The Arusha Regional Water Engineer has agreed to drill two boreholes, case, and develop the wells. A hydrogeologist agreed to help select and test the borehole sites.

#### 6. Farm Labor and Training

All types of farm labor are readily available near the farm. The farm employs three permanent tractor drivers and one temporary tractor driver, one temporary motor vehicle driver, one assistant mechanic, one water maintenance man, four night watchmen, one temporary seed processor, and six temporary masons and carpenters.

All training programs have been "on-the-job" education. The field managers have received training in the operation and calibration of planters, drills, sprayers, combine, sheller, and seed cleaner, in recognizing varietal characteristics of wheat in roguing, and in how and when to detassel corn for hybrid seed production.

Manual labor is used extensively in the building program and in weeding, side dressing, applying insecticide, and in picking, sorting, and ear grading maize.

### C. The Third Foundation Seed Farm

A prime objective of the Ministry of Agriculture was the establishment of a third seed farm in the Njombe-Iringa area in 1975. Much attention was given to finding a location that would be favorable as to soil, rainfall, access roads, buildings and 6,000 feet elevation. A tentative site was found at Dabaga, 32 miles from Iringa, but was not made available.

It then was decided to locate the third seed farm in the coastal area, in the Tanga Region. Several tracts of land were considered but none was made available. Land was also looked at in the Chalinze area. The area was not suitable for the production of foundation seed.

The search then continued in the Coastal Region near Dar es Salaam, where land was found on the Hooseni Sisal Estate. Four hundred hectares from this estate are being processed for assignment to the Seed Multiplication Project. The area is about seven miles from the Morogoro Road and 30 miles west of Dar es Salaam. It has good soil and is in a good rainfall area. The elevation is about 500 feet above sea level.

Electric power lines run through part of the estate. There are three roads to the area in fair condition. All of the land needs to be cleared of sisal and brush. There are no buildings and water will be piped about three miles. Plans are to start building houses and clearing land early in 1976. One D-6 Cat will be moved to the site for land clearing.

## V. SEEDS ACT

### A. Current Status of the Act

A Seeds Act was drawn up by an Experience, Incorporated field team in 1969 and submitted to the Tanzanian Government. In 1971 Frank Fanberg, present project coordinator, joined the team and assisted Tanzanian officials in putting the proposed Act into a form compatible with existing laws of the Republic of Tanzania. The Act, which makes provision for the control and regulation of agricultural seed standards, became law on December 6, 1973.

Subsidiary legislation under the Seeds Act was signed in December 1975 by the Minister of Agriculture, J. S. Malecela. The legislation applies to methods and procedures for seed testing and limits of variability. The new provisions resulted from recommendations of the Advisory Seed Committee.

### B. Brief Description of Provisions

The Seeds Act requires that all seed containers be labeled, stating the kind, variety, purity, germination, the date tested, etc.; also the name and address of the owner. Pedigreed and common are the only grades of seed

that can be sold in Tanganyika. The Act provides for a seed certification agency. It gives the Minister power to appoint seed inspectors and analysts.

The 1975 legislation requires that the rules of the International Seed Testing Association be used in the labeling of seed and for determining the limits of variability of seed analysis results. See Appendix E-I. Rules, regulations, and certification procedures of the Tanzanian Official Certification Agency have been prepared and are given in Appendix E-II.

### C. Status of Regulatory Service

Mr. Orris H. Shulstad, seed testing and certification specialist for Experience, Incorporated, was assigned to the project from September 19 to December 9, 1975, and assisted in the preparation of manuals, the listing of needed equipment, the training of personnel, and the operation of the laboratory. A six-week training period late in the year prepared three individuals to begin seed certification with the 1976 crop. Mr. Shulstad's report is given in Appendix E-III.

## VI. SEED LABORATORY

The National Seed Testing Laboratory and project headquarters will be constructed on the grounds of the University of Dar es Salaam, Morogoro. The tender notice is scheduled for publication in February 1976 and completion is planned for December of this year. Temporary and limited quarters have been set up in a building at the Development Institute in Morogoro, with Mr. J. Mallya in charge. The laboratory has been testing seed samples from the 1975 harvest.

Mr. Shulstad assisted in getting the operation underway and in checking on present equipment and ordering additional equipment. This list was reviewed by project leaders and then the order for purchase was placed with USAID.

## VII. SEED COMPANY

The Tanzania Seed Company, a joint venture of the National Agricultural and Food Corporation and the Commonwealth Development Corporation, was incorporated in November 1972. It is the distributor for all certified seed produced in Tanzania. The seed company is not a responsibility of the seed project, but it is an integral part of the seed industry and its operation is tied to the project. The Arusha Foundation Seed Farm has a contract to grow seed for the company, located in Arusha. All the production not needed for foundation seed is going to the company for distribution. Experience, Incorporated team members supply technical assistance to the company as requested.

### VIII. EXTENSION SERVICE

Extension no longer is the direct responsibility of Experience, Incorporated, however, its team members will continue to provide assistance as needed.

During 1975 two Tanzanian extension specialists, Mr. Fabyan Shempemba and Mr. Peter Nyassi, promoted the adoption by farmers of improved seeds and better agricultural practices. They held several discussions with regional and district authorities to explain the program of the Seeds Project.

To enhance this educational effort, they recommended the purchase of visual aid equipment at a cost of \$1,500. They thereby expect to better coordinate their work with farmers and with the foundation seed farms, the research stations and the Tanzania Seed Company.

### IX. PARTICIPANT TRAINING PROGRAM

Since 1971 Tanzanian participants have received formal university training plus some actual work experience, usually in the United States, and usually for two years. These are selected personnel who are destined to work on the project and assume full responsibility when the Experience, Incorporated advisors are phased out. One of them, Mr. Mashelle, is co-project coordinator with Mr. Fanberg.

A full listing of participants is given in Appendix A-III.

### X. INVENTORY AND PROCUREMENT

Mr. John Davis was added to the field team in April 1974 as inventory/procurement specialist. His initial assignment was the clearance of USAID materials under grant projects through the port of Dar es Salaam. Some materials had been in the port several months when he reported for duty. Not only did Mr. Davis clear the USAID materials and equipment through the ports, but also materials of other countries' grant projects, including Germany and China.

Mr. Davis devised procedures that will enable the project managers to expedite the preparation of documents and movement of materials from the docks to the project sites.

There were continued delays in the assignment of a counterpart to Mr. Davis. It was only during the last four months of his tour that Mr. J. S. Mwanarita was assigned as a counterpart to learn the operating procedures. This was not sufficient time to become proficient in the position.

Due to the lack of a counterpart and the assignment to clear equipment for countries other than USAID and apparent lack of interest on the part of the Ministry, Mr. Davis was not able to establish procurement and inventory procedures as originally planned when the position was initiated.

## XI. PROBLEMS ENCOUNTERED

### A. Weather

Rainfall varied widely between the two seed farms. Msimba Farm had a fairly generous total for the growing season and the full year, although dry weather early in the year hurt germination and some fields had to be replanted. At Arusha Farm the severe drought nearly spelled disaster. Less than 14 inches of rain fell from January 1 to plant maturity, and the effective rainfall was only eight inches, hardly enough to sustain life in a maize plant. Both farms will benefit greatly from irrigation projects now in the planning stage.

### B. Cultural Deficiencies

At the Arusha Farm the delays in receiving manganese supplement seriously affected the wheat crop. Where small amounts of manganese were applied the yield and quality of the seed increased by about 100 percent. More herbicide applications would obviate the need for much hand labor at weeding, a difficult job when the fields are muddy.

### C. Farm Machinery

The major problem in the seed production farm is keeping the machinery and seed processing equipment operational in a mechanically intensive operation. Spare parts did not accompany most of the machinery and the first order of spare parts has yet to arrive. Even then, it is impossible to accurately predict all the spares needed and this is expected to be a continuing problem. Experience, Incorporated home office has assisted in emergency situations by shipping urgently needed spares by air freight. Even with this method, down time on a machine can sometimes be from six to eight weeks during a critical period of an operation. The recommended practice of having backup or reserve machines would seem advisable. The present operating conditions at the farms in 1975 are on a basis of only enough machinery to cover the bare essentials for the acreage planted. The situation is especially vulnerable for the 1976 planting operation, considering the tractors have accumulated 1,000 and 1,500 hours and the rest of the machinery accordingly has accumulated a significant amount of wear. It is hoped that machinery arriving under the second USAID Loan Equipment Order 621-H-017, may alleviate the situation.

#### D. Crop Storage at Msimba

Storage for the 1975 crop was critical when it became apparent that the dryer and processing plant would not be constructed in time for the harvest at Msimba. Immediate plans were formulated to construct a steel frame building for a machine shed of 40 x 200 feet dimension to be used as a temporary storage for ear corn maize. A raised floor, ventilating shaft and sidewalls were constructed of wire mesh fence to poles cut from the mountainside. Approximately half the ear corn maize was cribbed in this structure, drying down to 12 percent moisture by natural air, producing excellent quality seed. The balance of the crop was stored in similar make-shift cribs installed under the sisal factory roof.

Future plans should be made for construction of adequate crib storage space of a permanent nature in addition to the drying plant, which will not have the capacity to handle the total acreage of the Msimba maize seed crop.

Besides hand picking and cribbing the large crop of maize, processing and cleaning 65,000 bushels of maize in time for delivery for seed posed even a larger problem.

Two aluminum lightweight elevators were air freighted from Experience, Incorporated to assist in mechanizing the material flow, eliminating handling the maize by hand labor in bags. The seed cleaner and treater were set up in the warehouse, whereby maize dumped from the truck grain box onto a cement platform was elevated by a vertical leg elevator into the cleaner. Capacity was limited to 500 bags (90 kilograms) per day, however, all seed was cleaned and processed within a three month period of time.

#### E. Buildings

The staff housing at both farms is essentially complete. If all goes as planned, a drying plant and seed processing building will be erected at each farm in 1976, as well as a warehouse at Msimba. Perhaps the most serious deficiency is the lack of a workshop at Arusha. The long delay has increased the cost estimates, with a consequent decrease in the size of the projected building.

Also long delayed was the establishment of a seed testing laboratory at Morogoro. Temporary quarters have been found and a new building is planned for 1976.

### XII. PROPOSED WORK PLANS FOR 1976

Following is a summary of the work plans submitted by the Experience, Incorporated team. Detailed plans are given in Appendix F.

### A. General

1. Establish the Seed Regulatory Service and the Seed Certification Agency. This entails the training of inspectors to test seed samples and make field inspections. These inspectors must be able to interpret the seed law and be acquainted with all rules and regulations.
2. Establish the third foundation seed farm in the coastal area. A start is planned for early 1976 on clearing land and putting up the necessary buildings.
3. Supervise the assembling and delivery to the farms of all equipment ordered under the second loan.

### B. Msimba Foundation Seed Farm

1. Clear another 300 acres, expanding to 1,700 acres the area devoted to seed production.
2. Grow maize, sorghum, soybeans, sesame, and millet on all the available land and supervise the growing of 100 acres of rice seed at Kilingali Rice Farm.
3. Maintain quality control and separation of varieties to meet specifications on the seed label.
4. Assist in the planning and supervision of the drying and processing plants, and of permanent maize cribs if funds become available.
5. Expansion of service capacity to cope with expected enlargement of equipment fleet.
6. Effecting a major order of parts for the new equipment that will be arriving.
7. Stabilizing a functional mechanization support unit.

### C. Arusha Foundation Seed Farm

1. Improve the crop management system covering 600 acres of wheat, 550 acres of maize, and 50 acres of soybeans.
2. Establish methods of seed handling during planting, harvesting, processing, and storage to minimize the possibility of mixture and contamination.
3. Construct a water storage tank.
4. Coordinate with the Regional Engineer and Comworks in the construction of the warehouse, seed processing plant and drying plant.

5. Supervise construction of the farm workshop.
6. Establish Phase I and Phase II of the irrigation system.
7. Set up seed processing machinery in the new plant.
8. Supervise the building of fences and gates to enclose the buildings and grounds.

## APPENDIX A

### SEED MULTIPLICATION PROJECT PERSONNEL

- I. EXPERIENCE INCORPORATED PROJECT TEAM
- II. TANZANIAN PROJECT STAFF
- III. PARTICIPANT TRAINING

## PROJECT PERSONNEL

### I. EXPERIENCE INCORPORATED PROJECT TEAM

At the end of 1975 the team had five members in Tanzania. Two others were there for part of the year -- the Inventory Procurement Specialist and the Seed Testing and Certification Specialist.

1. Project Coordinator, Franklin Fanberg is responsible for overall direction of the project team and for coordinating activities with the Tanzanian Government and USAID officials. He began his second two-year tour assignment in September 1974.
2. Msimba Farm Manager, Sheldon Sandager is responsible for coordinating the crop production, harvesting and seed processing activities at the Msimba Foundation Seed Farm, also training senior staff and supervising construction. He arrived in September 1974.
3. Msimba Agro-Mechanic, John Wagner is responsible for maintenance and repair of equipment. This includes setting up shop facilities, inventory control and maintenance schedules, also training drivers in the care and repair of equipment. He arrived at the farm in Sept. 1974.
4. Arusha Farm Manager, Duane Eriksmoen is responsible for managing the overall farming operations, supervising and training senior staff on technical matters relating to crop production, and assisting in the building program. He first arrived in Tanzania in April 1973. After home leave he returned in August 1975 to begin another two-year assignment.
5. Arusha Agro-Mechanic, John T. Short is responsible for the maintenance and service schedules for all farm machinery and vehicles, for establishing a parts inventory, for supervising the installation and operation of seed processing equipment, for training and assisting the counterpart in directing junior mechanics and drivers, and for supervising the water supply system.
6. Procurement Specialist, John Davis arrived in Tanzania in March 1974 as inventory and procurement specialist to supervise the clearance and transportation from the docks of equipment shipped from the United States for the Seed Multiplication, Masai, Tsetse Fly, and other AID assisted projects. Later he helped clear imports from other nations providing agricultural aid. His services were terminated in August 1975. He provided valuable assistance to the Seed Multiplication project at a time when delays in the arrival of equipment threatened to seriously impair farm operations.

7. Seed Testing and Certification Specialist, Orris H. Shulstad served from mid-September to early December, assisting in setting up the seed testing laboratory at Morogoro, preparing the seed certification program, advising on additional equipment, and assisting in the development of training manuals for seed certification and other regulatory services.

## II. TANZANIAN PROJECT STAFF

1. Co-Project Coordinator, Michael Mashelle has been connected with the project from the start. He served on the study team that outlined the program in 1969. When the present project started he was selected to attend the University of Minnesota for two years in the participant training plan. Returning to the project in 1973, he has served as counterpart to Mr. Fanberg at project headquarters in Dar es Salaam.
2. Co-Extension Specialist, Peter Nyassi also spent two years at the University of Minnesota, specializing in extension work. He joined the project team in 1973.
3. Co-Extension Specialist, Fabyan Shempemba was assigned to extension duties with Mr. Nyassi after Robert Long, Extension Specialist, left the Experience, Incorporated team to return to the United States.
4. Seed Laboratory Supervisor, Joseph Mallya studied at the University of Minnesota as the first participant in the United States training program, then took a short course in seeds at Mississippi State University and returned to the project in April 1973. Mr. Mallya is responsible for establishing the seed laboratory at Morogoro.
5. Entomologist, Adalbert Mushi earned his M. A. degree in entomology at the University of Minnesota as a participant in the training program. He returned to the project in July 1973 and serves as entomologist for the seed project and the Ilonga Research Station.
6. Msimba Foundation Seed Farm. The farm staff at Msimba is starting the fifth year of production. The Tanzanian staff has main responsibility for administrative functions, the Experience, Incorporated team for technical matters. Four members of the Msimba staff are away for special training: Emil Palangya, Leonard T. Mwakikosa, Titus Lugutu, and Ismael Hussein.

S. B. Mamiro, Senior Field Officer I. As Station Manager he has responsibility for Tanzanian Government funds and policy, also procurement of building material and farm supplies.

Emmanuel J. N. Lujuo, Agricultural Officer III. As Co-Farm Manager he supervises Tanzanian senior and junior staff at the farm.

T. E. Lusuva, Agricultural Engineer III. As Co-Agro-Mechanic, Mr. Lusuva supervises Tanzanian staff in the care and operation of equipment. He specialized in seed processing equipment at Mississippi State University, where he obtained the B. S. degree.

Abdu Alli Mbagu, Assistant Field Mechanization III. Mr. Mbagu is responsible for the workshop technical supporting staff.

Geremiah Everist, Field Officer Mechanization II. Mr. Everist shares responsibility for the workshop technical supporting staff.

Pilica Mulungu, Assistant Field Officer I. Mr. Mulunga has responsibility for the field staff.

Roman Haule, Field Officer III. Mr. Haule supervises seed quality control in the field.

Musa Mwakangqale, Agriculture Field Officer III. Mr. Mwakangqale supervises seed quality control at the warehouse.

7. Arusha Foundation Seed Farm. Staffing of the Arusha farm started in 1973. Tanzanian supervisory personnel include:

Stephan Werekyasa, Field Officer I, Co-Farm Manager. Assigned in May 1973. Responsibilities are to supervise all Tanzanian senior and junior staff, administrative responsibility for Tanzanian government funds and policy, and procurement of all building material and farm supplies.

Leonard Mwakikosa, Agricultural Officer III, Field Manager for maize and other row crops. Assigned December 1975. Responsibilities are to supervise all field production activities relating to maize and other row crops. This includes seed-bed preparation, planting, weeding, fertilizing, insect control, harvesting, and processing.

I. S. Swai, Field Officer III, Field Manager for wheat and other field crops. Assigned on August 1973. Responsibilities are the same as for the position above except for wheat instead of maize.

M. N. Nguo, Executive Officer I, Office and Stores Clerk. Assigned April 1975. Responsibility is to keep accounts and records according to established government procedure. To maintain records of all stock received into and issued from the farm stores.

A. O. Magiri, Assistant Field Officer II, Foreman Mechanic. Assigned August 1974. Responsibility is to maintain all machinery in good working condition, to train tractor drivers and junior mechanics in care, servicing, and operating farm machinery.

Agnes Maro Sekiete, Assistant Field Officer II, Assistant Field Manager and Acting Extension Officer. Assigned July 1973. Responsibilities are to assist the field managers, to record rainfall, insect problems, weed problems, etc., that affect production and to prepare displays, etc for the Saba Saba Fair. To supervise the horticultural unit which supplies fresh vegetables to the farm staff.

Other members of staff who have left during the year:

Hanson Mshanga, Field Officer III, left in July 1975 for participant training in the United States.

Roman Haule, Assistant Field Officer II, transferred to Msimba.

H. Uledi, Sub-building Inspector, transferred to Dar es Salaam.

Ali Makata, Field Officer III, came to the farm in February 1975 and left in December 1975 to join National Development Corp.

### III. PARTICIPANT TRAINING UNDER PROJECT 621-11-130-093 SEED MULTIPLICATION AND DISTRIBUTION

#### Participants Returned from Training

<u>Name</u>	<u>Field of Training &amp; Name of Institution</u>	<u>Date of Return</u>
1. Miss Alisha LEMA	B. Sc. Agric. Seed Analysis (Mississippi State University)	12/21/1974
2. Emmanuel LUJUO	B. Sc. Agronomy (Purdue University)	12/23/1973
3. Tiberius LUSUVA	B. Sc. Agric. Engineering (Mississippi State University)	12/21/1974
4. Bakari LUSSEWA	B. S. Agronomy (Purdue University)	12/22/1973

5.	Joseph I. MALLYA	B. S. Agronomy (University of Minnesota)	4/2/1973
6.	Michael MASHELLE	B. S. Agronomy (University of Minnesota)	3/5/1973
7.	Adalbert MUSHI	M. Sc. Entomology (University of Minnesota)	7/7/1973
8.	Peter NYASSI	B. S. Agronomy (University of Minnesota)	9/22/1973
9.	Emiliano PALLANGYO	M. S. Agronomy (Mississippi State University) Did not complete M. S. program due to ill health	12/19/1975
10.	Fabyan SHEMPEMBA	M. S. Agric. Education (Oklahoma State University)	12/23/1973
			<u>Estimated Completion Date</u>
1.	Kitambi MASANJA	B. S. Agronomy (University of Minnesota)	March 1977
2.	Ralph MIZAMBWA	B. S. Agronomy (Western Illinois University)	June 1977
3.	Charles MMARI	B. S. Agronomy/Extension (Mississippi State University)	Dec. 1976
4.	Ernest MOSIA	B. S. Agronomy (Western Illinois University)	June 1977
5.	Paschal MSEKE	B. S. Agric. Engineering (Oklahoma State University)	Dec. 1975
6.	Hanson MSHANGA	B. S. Agronomy (Western Illinois University)	June 1977
7.	Leonard MWAKIKOSA	B. S. Agronomy/Farm Mgmt. (Western Illinois University)	Dec. 1975
8.	Lawrence MZEE	B. S. Agronomy/Extension (Western Illinois University)	June 1977

APPENDIX B  
CROP SUMMARIES AND  
CROPPING PATTERNS AT THE  
MSIMBA AND ARUSHA FOUNDATION SEED FARMS

TABLE B-1. MSIMEA FOUNDATION SEED FARM -SURGARY -CROP PLANTED, 1975

CROP	VARIETY	SOURCE	ACRES PLANTED	PLANTING DATE	HARVEST DATE	FERTILIZER USED LB/ACRE	PESTICIDES USED	HERBICIDE USED	COMMENTS
MAIZE	I.C. Foundation	Ilonga Rescar.	1170	Jan.5- Febr. 11	June 12th to July 14th	40% N sidedress 114# 4-25-18 Starter N.P.K	75%DDT. Army worm	Gasprin 80% W.P 3 1/2 LB/Acre	200 acres replanted lwe to drought March 5-8 Fertilizer used on 700 acres of old land-New land 'NONE'. Outbreak of
	I.C. Full- Yellow	Ilonga Research	50	Feb 21-28	21st -23rd July	25% N Sidedress starter -None	75% W.P D.D.T	Gas. 3 1/2 #/a + I.C. 4 #/Acre	Army worm on Jan.24 controlled on 500 acre with 75% E.C N.P
	Katumani 2nd Gen.	Certified seed	20	March 3	14th June- 16th June.	NONE	NONE	Gas. 3 1/2 #/a 1/2 2,2,4-D/a	
SORGHUM	Sorena	A.S.I Udirigwa- ru. Ercolen's	100	March 1 & 2	August 16th - August 22nd	N.P.K	35% Endosulfan	1/2 L 2,4-D/a	American Boll worm infestation
	Dulu	Breeders seed A.S.I Udirigwa- ru.	100	Mar. 3&4	August 25th - September 20th	4 - 25 -18	E.C	Gasprin 80%	sprayed with Endosulfan 35% E.C Rate 21/acre
	Dobbs Bora	W.M.M.O Dr. Judy 2nd Gen.	30	March 4	August 25th - August 26th	200 lbs/acre		3 1/2 #/a	
SOYBEANS	78/101	Foundation Ilonga	20		25th July				Poor seed germination and viability with crusting conditions caused poor stand. Sprayed for Beetles white flies at flowering stage.
	3H/1	A.S.I Ilonga Research	15	March 6	to				
	IH/192	A Gen -Ilonga	20	March 6		NONE	Endosulfan 35%	Ariben pre- Emergence	
	Improved Belgian	Foundation Ilonga	1	March 7	4th August		2 litre/acre		
	78/103	2nd Gen Ilonga	60	March 10-12					
BURRUSH MILLET		W.M.M.O Dr. Judy	4	March 1	June 14th - June 23rd	200 # N.P.K	NONE	NONE	Considerable lodging
FINGER MILLET	Comp. I	W.M.M.O -Judy 3rd Generation	5	March 1	July 21st July 23rd	NONE	NONE	NONE	Heavy rain + flooding in seedling stage Resulted in considerable loss.

TABLE B-1. MSIMBA FOUNDATION SEED FARM - SUMMARY - CROP PLANTED, 1975....continued

CROP	VARIETY	SOURCE	ACRES PLANTED	PLANTING DATE	HARVEST DATE	FERTILIZER USED LB/ACRE	PESTICIDE USED	HERBICIDE USED	COMMENTS.
SESAME	SS2S -7	Breeder A.R.I Ilonga	3	March 3	June 18th	NONE	NONE	NONE	Some Mosaic disease Noted. Strain not identified.
	SS2S - 4	Breeder	3	March 2	June 17th				
	IMPROVED MORONA	Breeder	2	March 2	June 16th				
RICE 1/159.	Kihogo Red#25	Breeder	1	March 31st	August 18th to Sept. 30th	NONE	NONE	NONE	Hand weeding was performed, lack of water for irrigation caused poor yield.
	Ganti-Tunduru	Seed	1	March 28th					
	Taiwan #14	Ilonga	1	March 29th					
	I.R 8	A.R.I	1	April 2nd					
	Afaa-Mwanza		1	March 28th					

TABLE B-2. MSEMBA FOUNDATION SEED FARM - 1975 CROP SUMMARY

\* PROCESSING INCOMPLETED \*

CROP	VARIETY	TOTAL SEED BAGS	TO BE RETAINED FOR SEED	DELIVERED SEED/BAGS	BALANCE ON HAND (INCLUDING SEED)	* ESTIMATED SCREENINGS & MILLING	* ESTIMATED TOTAL YIELD.
MAIZE 90KG + 25KG BAGS	I.C. White	9390 (90kg)	85(90kg)	9769(90kg)	121	} 284-Screening(90kg) } 5000 Bags (90kg)	} 18845 (90kg) Bags } 1696 Metric Tons
	I.C. White (90kg - 2895)	10460 (25kg)		1286 (25kg)	554		
	Katumani (167-KG)	603 (25kg)	30	2(25kg)	601		
	I.C. Yellow	3219(25kg)	2				
SORGHUM 90KG. BAGS	Serena	1072	16	1056	16	} 70 Bags } 90 kg.	} 2160 (90 kg) Bags
	Lulu	721	1	719	2		
	Dobba Bora	317	5	293	19		
SOYBEANS (90KGS) BAGS	TH/192	64	-	33	25	} 120 bags } 488 (90kg Bags)	}
	TH/101	269	6	216½	22½		
	3H/1	34½	6	65kg	33		
	IPR. Pelican	45kg.	45kg	-	-		
SESAME 80KG BAGS	SSBS -4	8½	25kg	7	1½	} 16kg }	} 25(80kg(bags
	SSBS -7	6½	25kg	5	1½		
	IPR. Morada	10	25kg	9	1		
MILLET	Serena Comp. I	31	25kg	21	10	2 bags	33(90kg Bags)
BULRUSH							
FINGER MILLET	Composite I 119	20KG 1 KG	20KG.	-	20KG. 1KG.		20Kg.

TABLE B-2. MSIMBA FOUNDATION SEED FARM - 1975 - CROP SUMMARY....continued

CROP	VARIETY	TOTAL SEED BAGS	TO BE RETAINED FOR SEED	SEED DELIVERED	BALANCE ON HAND INCLUDING SEED	*ESTIMATED SCREENINGS & MILLING	* ESTIMATED TOTAL YIELD
RICE 75KG. BAGS	Kihogo Red	4	4 bags	-	4	NONE	4 bags
	Taiwan # 14	36 KG.	36KG.	-	36 KG	"	36 KG.
	IR -8	50KG	50KG	-	50KG.	"	50KG.
	Afaa Mwanza 1/159	9 bag + 56kg.	9 bag + 56kg	-	9bags + 56 kg	"	9 bags + 56 kg
	Ganti Tunduru	1 bag + 56kg	1 bag + 56 kg	-	1 bag + 56kg.	"	1 bag + 56 kg.

Table B-3. CROP SUMMARY 1975 ARUSHA FARM

CROP	VARIETY	SOURCE	ACRES PLANTED	DATE PLANTED	DATE HARVESTED	FERTILIZER USED Lb./acre	PESTICIDE USED	YIELD 90 kg bag	DISPOSITION	COMMENTS
MAIZE	UCA	Arusha FSF	541	Jan 23 to March 8	Sept 10 to Sept 29	100 N 20 P 20 K	DDT	1300	634 Seed 310 MHC 90 Cwn 100 Screen	Severe Drought. 100 ac not harvestable. H632 perished. All poor quality.
	H632	Tanseed	50	Jan 28	-	do	-	-	53 Staff 85 Feed 28 Shrink	
WHEAT	W3837	Arusha FSF	317	Apr 4-16	Aug 22	25 N	2,4-d	1300	898 Seed 210 Cwn 141 Screen 14 Mill 37 Shrink	Severe Drought. No Ma supplies available. 100 acres not harvestable.
	W3503	Arusha FSF	250	Apr 10-24	Sept 8	5 P				
	W3904	Arusha FSF	10	Apr 26	Sept 6	5 K				
	W3704	Arusha FSF	10	Apr 26	Sept 7					
	W3742	Arusha FSF	5	Apr 26	Sept 7					
	W3907	Lyamungu	20	Apr 26	Sept 5					
BEANS	Canadian Wonder	Machu Shah	50	May 1	Aug 20	nil	nil	47	42 Cwn 5 Rejects	Severe Drought. Poor seed. Planted late.
SOYA	Bossier	Arusha FSF	1	May 2-3	Sept 15	nil	nil	3	5 Cwn	Severe Drought. Cut worms. Planter damage.
	XB/2	Arusha FSF	1			nil	nil	2½		
	Elyvoor	Arusha FSF	1		Oct 1	nil	nil	2		

ARUSHA FOUNDATION SEED FARM

Table B-4.

ACTUAL AND PROJECTED ACREAGE AND SEED PRODUCTION

	1972		1973		1974		1975		1976		1977		1978		1979	
	ACRES	Tons	Ac	Tons	Ac	Tons	Ac	Tons	Ac	Tons	Ac	Tons	Ac	Tons	Ac	Tons
<u>MAIZE</u>																
UCA	-	-	40	9.4	219	185.5	600	128.0	550	825	400	800	300	600	100	200
Hybrid	-	-	-	-	25	15.0	-	-	-	-	100	200	200	400	400	800
<u>WHEAT</u>																
W3837	-	-	10	2.3	95	52.8	370	52.2	170	170						
W3503	-	-	-	-	45	34.1	200	60.5	100	100						
W3907	-	-	-	-	48	0.0	20	13.7	100	100						
W3904	-	-	-	-	3	0.5	10	3.7	100	100						
W3704	-	-	-	-	2	0.3	10	4.4	100	100						
W3742	-	-	-	-	2	0.2	6	1.0	25	25						
Felican	-	-	-	-	-	-	-	-	35	35						
Horen	-	-	-	-	-	-	-	-	12	12						
New Varieties to be released by Lyamungu Research Station											540	800	540	1000	540	1200
<u>SOYA</u>																
Bossier	-	-	-	-	$\frac{1}{2}$	30 kgs	1	0.3	6	3						
XB/2	-	-	-	-	$\frac{1}{2}$	30 kgs	1	0.2	5	2						
Blyvoor	-	-	-	-	$\frac{1}{2}$	30 kgs	1	0.2	-	-						
Others	-	-	-	-	$\frac{1}{2}$	0.0	-	-	-	-	20	10	50	25	100	50
<u>Field Beans</u>																
Beans	-	-	-	-	270	33.2	50	4.7	45	25	100	50	100	50	100	50
<u>OTHER CROPS</u>																
	-	-	104	1.4	40	15.2	-	-	-	-	40		10			

Table B-5. CROPPING PATTERN (See Figure B-4)

Field	Acres	1974		1975		1976	
		Short Rains	Long Rains	Short Rains	Long Rains	Short Rains	Long Rains
A1	52	Fallow	W3907	Fallow	Beans	Fallow	W3904
A2	16	Fallow	W3907	Fallow	W3503	Fallow	W3503
A3	38	Fallow	Beans	Fallow	{ W3907 W3904 W3704 W3742	Fallow	W3503
A4	30	Fallow	Barley	Fallow	W3503	Fallow	W3904
A5	31	Fallow	W3503	Fallow	W3503	Fallow	W3704
A6	25	Fallow	W3503	Fallow	W3503	Fallow	W3704
A7	28	Fallow	Beans	Fallow	W3837	Fallow	W3704
A8	44	Fallow	W3503	Fallow	W3503	Fallow	W3907
A9	49	Fallow	(NAFCO)	Fallow	W3837	Fallow	W3837
A10	49	Fallow	(NAFCO)	Fallow	W3837	Fallow	W3837
A11	42	Fallow	(NAFCO)	Fallow	W3837	Fallow	Beans
A12	80	Fallow	(NAFCO)	Fallow	W3837	Fallow	W3837
A13	31	Fallow	Beans	Fallow	W3837	Fallow	W3503
B1	61	Fallow	M.UCA	Fallow	M.UCA	Fallow	M.UCA
B2	44	Fallow	M.UCA	Fallow	W3503	Fallow	M.UCA
B3	30	Fallow	M.UCA	Fallow	W3503	Fallow	M.UCA
B4	43	Fallow	M.UCA	Fallow	M.UCA	Fallow	{ Pelican Heron
B5	30	Fallow	M.UCA	Fallow	M.UCA	Fallow	W3742
B6	62	Fallow	(NAFCO)	Fallow	M.UCA	Fallow	M.UCA
B7	33	Fallow	(NAFCO)	Fallow	M.UCA	Fallow	M.UCA
B8	63	Fallow	(NAFCO)	Fallow	M.UCA	Fallow	M.UCA
B9	22	Fallow	(NAFCO)	Fallow	M.UCA	Fallow	M.UCA
B10	49	Fallow	M.UCA	Fallow	M.UCA	Fallow	M.UCA
C1	34	Fallow	Beans	Fallow	M.UCA	Fallow	M.UCA
C2	38	Fallow	W3837	Fallow	W3837	Fallow	M.UCA
C3	43	Fallow	W3837	Fallow	M.UCA	Fallow	W3503
C4	67	Fallow	Beans	Fallow	M.UCA	Fallow	W3907
D1	30	Fallow	Beans	Fallow	W3503	Fallow	M.UCA
D2	34	Fallow	M.UCA	Fallow	M.UCA	Fallow	M.UCA

FIGURE B-1. MSIMBA SEED FARM - KILOSA TANZANIA - SUMMARY OF CLEARED LAND

(1776 TOTAL ACRES CLEARED)

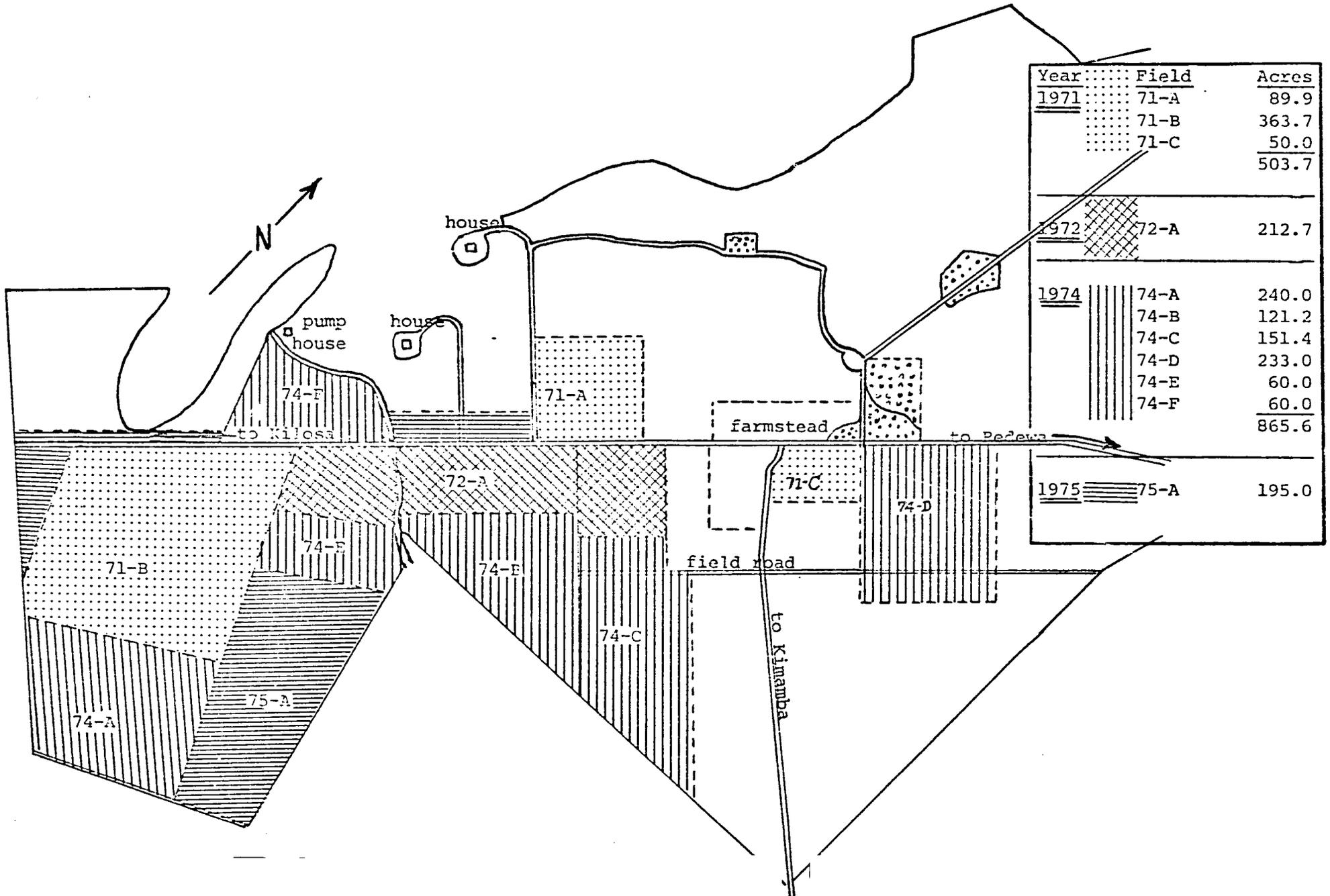
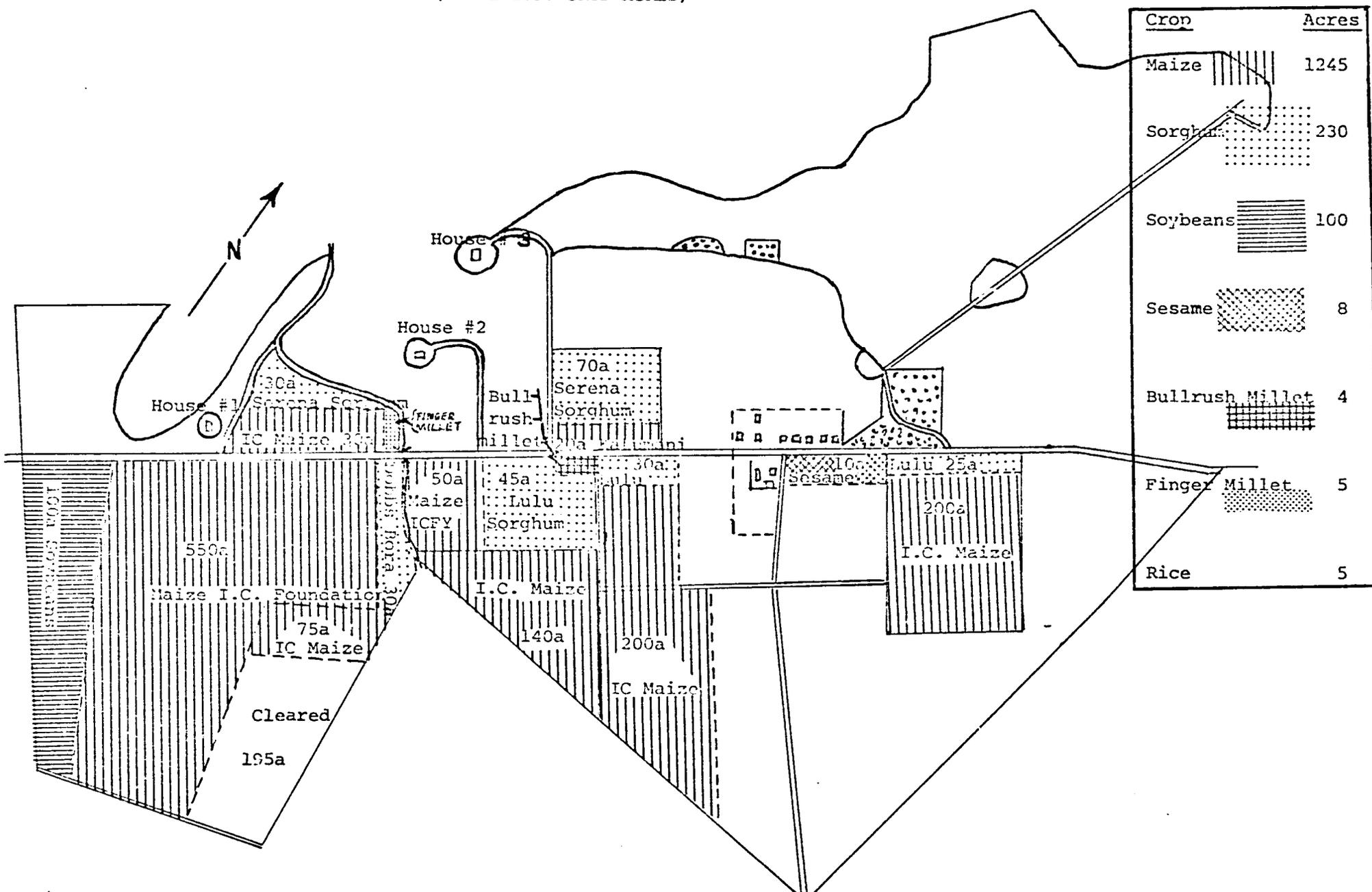


FIGURE B-2. MSIMBA SEED FARM - KILOSA, TANZANIA - 1975 CROP PLANS

(TOTAL 1597 CROP ACRES)



Crop	Acres
Maize	1245
Sorghum	230
Soybeans	100
Sesame	8
Bullrush Millet	4
Finger Millet	5
Rice	5

FIGURE B-3. MSIMBA SEED FARM - KILOSA, TANZANIA - 1976 CROP PLANS

(TOTAL 1700 CROP ACRES)

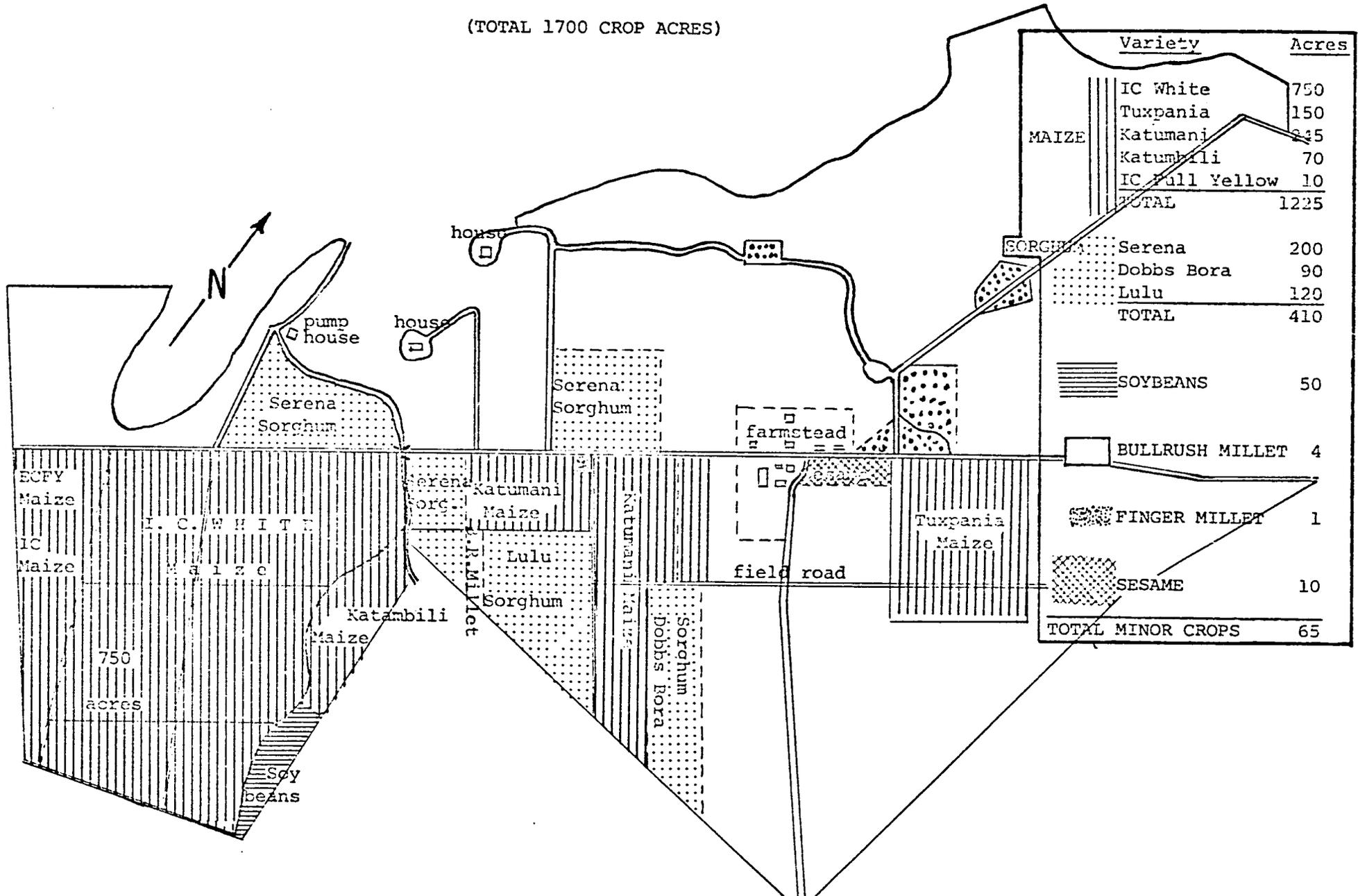
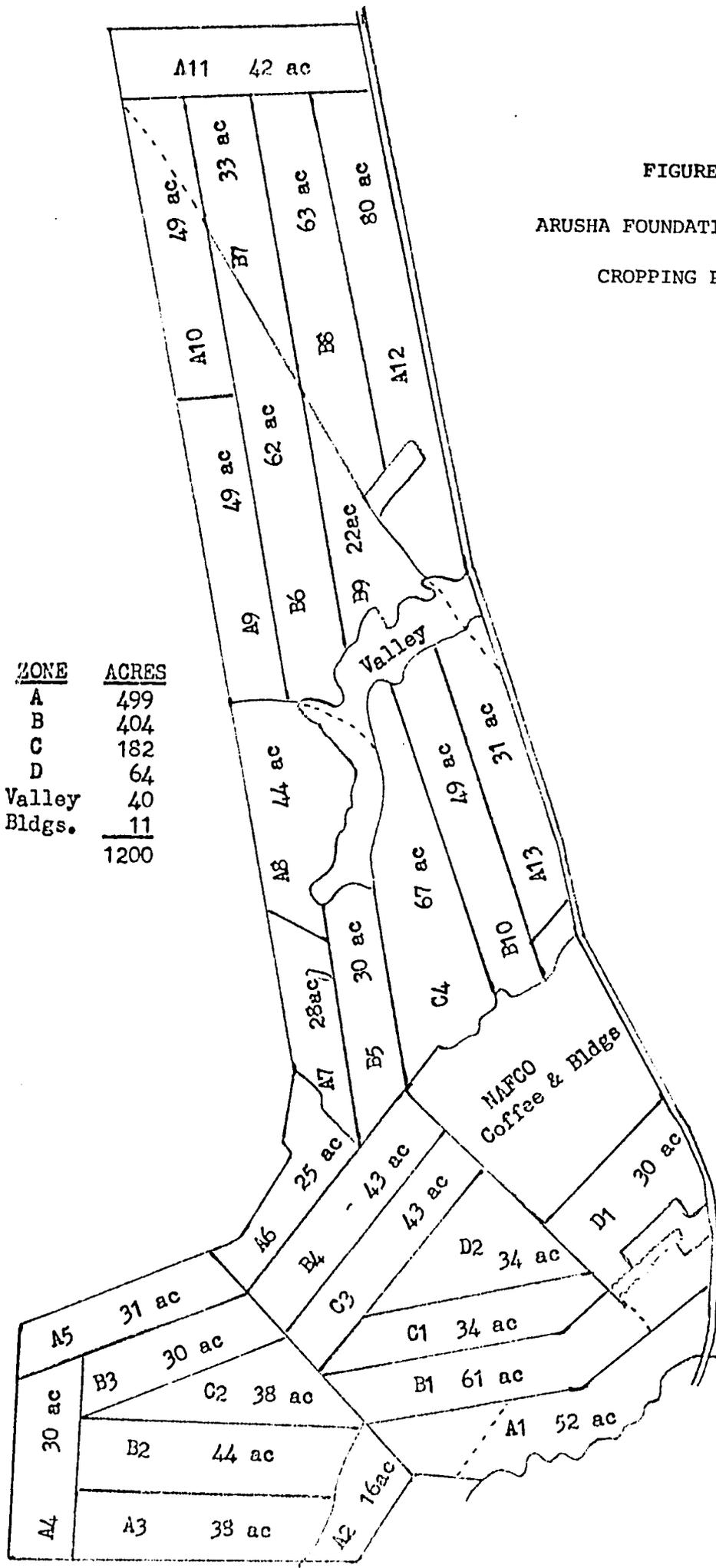


FIGURE B-4.

ARUSHA FOUNDATION SEED FARM

CROPPING PATTERN



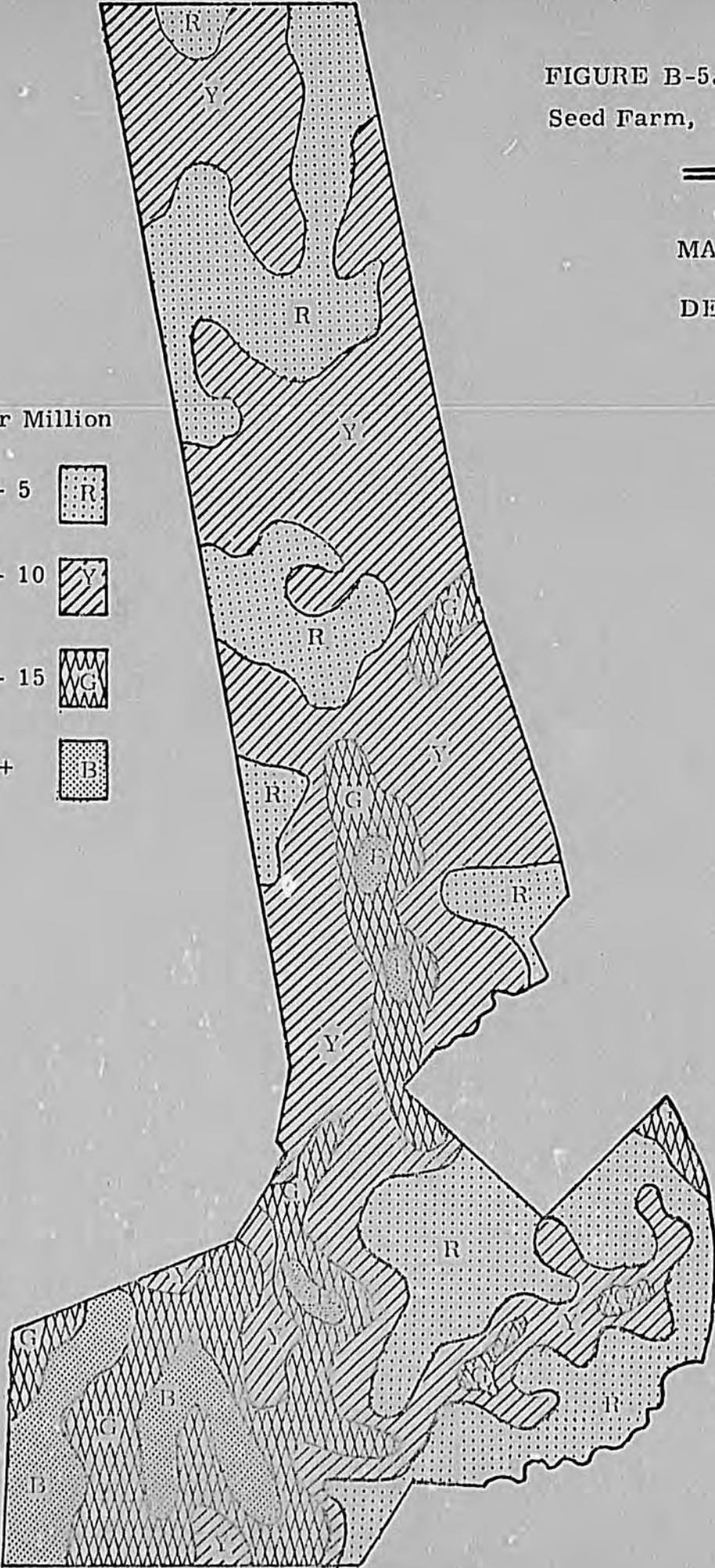
<u>ZONE</u>	<u>ACRES</u>
A	499
B	404
C	182
D	64
Valley	40
Bldgs.	11
	<hr/>
	1200

FIGURE B-5. Arusha Foundation Seed Farm, Arusha, Tanzania

=====  
MANGANESE  
DEFICIENCY

Parts per Million

- 0 - 5 
- 5 - 10 
- 10 - 15 
- 15 + 



APPENDIX C  
FIELD AND PROCESSING EQUIPMENT  
AND FARM BUILDINGS AT  
MSIMBA AND ARUSHA FOUNDATION SEED FARMS

TABLE C-1.  
FIELD EQUIPMENT AT KIBINDA SEED FARM.

TYPE	MAKE/MODEL	SERVICABILITY %, SCHEDULED USE	PRESENT COND./Hrs. (Yrs.)	AGE (Yrs.)
SOURCE: USAID LOAN 621-N-015				
Crawler	Cat. D6c	100	V.G./2000	2
"	" " x-ferred to Arusha)	(100)	(1000)	N/A
Combine Harvester	IH 715	80	V.G./500	2
"	" "	80	V.G./300	1
Tractor	" 966	95	V.G./1700	2
"	" "	95	V.G./900	2
"	" 544	95	V.G./1000	2
Forklift	" H500(A)	100 until..	Demolished, 50%	2
Sprayer	Blue Boy 500	90	V.G./500	2
Planter (Cyclo)	IH 400, 6-row	90	Good	2
"	" " "	90	Fair	2
S.T. Harrow	" 15 "	95	Good	2
Rotary Hoe	" "	N/A	Unused	2
Cultivator	" (Toolbar)	90	Poor	1
"	" "	70	"	1
Corn Picker	" 2PR	N/A	Unused	1
"	" "	"	Unused	1
Disk Plow	JD E-0225	90	Good	2
"	" "	60	Fair	2
Comb. Drill	" FB 177B	100	V.G.	2
Chisel Plow	" 1600	85	Good	2
Disk Harrow	Athens 126	95	"	2
Per. Spreader	Gandy 1012	100	V.G.	2
Wagon (Tipping)	Rasten 80	100	Good	1
Water Tank	Fruchauf 211-107E2	N/A	Unused	1
Fuel Tank	" H 105A2	100	Ex.	1
26 units		91% Ave.		

SOURCE: Other; local distributors.

Tractors(2)	Ford 4000	95	Good	6+
"	" "	N/A	Rebuilding	6+
"	MF 165	N/A	"	6+
Disk Plow(2)	" "	95	Good	4+
Disk Harrow	" "	90	Fair	
Disk Harrow	Ransomes	95	Good	
Cultivators(2)	IH Vibra-shank	95	Good	3+
Corn Planter	JD Plate, 4-row	N/A	Good	4+
"	" "	N/A	Poor	4+
Spreader	Vicon, Rotary	N/A	Good	3+
Rotary Cutter	IH, 211	90	Poor	4+
14 units		93.5% Ave.		
40 Units - Total		91.5% - Total Ave.		

TABLE C-2. PROCESSING EQUIPMENT AT MSIMBA SEED FARM.

TYPE	MAKE/MODEL	SERVICEABILITY %, SCHEDULED USE	PRESENT CONDITION	AGE (Yrs.)
SOURCE: USAID LOAN 621-R-015				
Corn Sheller	Union Iron Works 2½	95	V.G.	2
Flight Elevator	JD 428	95	V.G.	1
Trough	Wilkom AF	95	Good	1
"	"	95	Good	1
Bucket Elevator	Universal	98	V.G.	1
"	"	N/A	Unused	1
Seed Treater	Gustafson BS	N/A	Unused	2
Seed Cleaner	Crippen H-434A-25	98	V.G.	1
Bagger	Hove Richardson G17	100	V.G.	1
Bag Closer	Fischbein	95	V.G.	1
Balancer-Bag Closer	"	N/A	Unused	1
Vacuum Cleaner	Tornado	100	Ex.	1
Spiral Separator	"	N/A	Unused	1
"	"	N/A	Unused	1
Blower	Barry 75½ (AF DN)	N/A	Unused	1
Burner	Hauck DC5-300	N/A	Unused	2
Platform Scales	Hove Richardson	100	Ex.	1
Other: Scoops, Forks, Measures, Testers, ect.	"	N/A	Good	1
		<u>97½</u> Ave.		

SOURCE: TANZANIA SEED CO. On loan.

Seed Treater	Plantector	<u>100</u>	V.G.	1
		<u>97½</u> Total Ave.		

APPENDIX - C

TRANSPORT VEHICLES AT MSIMBA SEED FARM.

TYPE	MAKE/MODEL	SERVICEABILITY %, SCHEDULED USE	PRESENT COND./Yr.	AGE (Yrs.)
SOURCE: USAID LOAN 621-R-015				
Truck	IH 1700	<u>95</u> 95½ Ave.	V.G.	2
SOURCE: Local distributors.				
Truck	Bedford	80	Fair	6+
Pick-up	Land Rover	85	Good	4
General	Ford Bronco	70	Poor	4+
"	"	70	Poor	4+
Motorcycle	BSA	95	Good	3+
		<u>80½</u> Ave.		
		<u>82½</u> Total Ave.		

TABLE C-3.  
WORKSHOP EQUIPMENT AT MSIMBA SEED FARM.

TYPE	MAKE/SIZE	SERVICEABILITY %, SCHEDULES USE	PRESENT CONDITION	AGE (Yrs.)
SOURCE: USAID LOAN 621-H-015				
Metal Lathe	Rockwell, 10"	100	Ex.	2
Welder, Elec.	Airco, 200amp.	100	Ex.	1
Air Compressor	Sears, 150psi	100	V.G.	1
Drill Press	Craftsman, 1/2"	90	V.G.	1
Power Hacksaw	" , tiny	N/A	Fair, but undersize	1
Grinder	Blue Point, 1hp.	100	V.G.	2
Portable Drill	" " , 3/4"	100	Ex.	2
" "	" " , 1/2"	100	V.G.	2
" "	" " , 1/4"	100	V.G.	2
Sabre Saw	Stanley, small	80	Good	1
Battery Charger	Sears, 8amp. x 6-12v	100	Ex.	1
Voltage Transformer,	230-115v	100	Ex.	1
Hydraulic Tester	Cwatonna, 5000psi	100	Ex.	1
Puller	Snap-on, large	100	Ex.	1
Timing Light	Snap-on	100	Ex.	1
Floor Jack	Hein-Werner, 20 tons	95	V.G.	2
Soldering Iron	Snap-on	100	V.G.	1
Bench Vice	Craftsman, 5in.	100	V.G.	1
Chain Hoist	Thorn, 2T	100	Ex.	1
Tool Set, Chest	Snap-on	100	V.G.	2
Other Tools & Sets	Snap-on, small	100	V.G.	2
		98% Ave.		
SOURCE: Other, local distributors.				
Anvil		100	V.G.	1
Bench Vice	Fukung, 150mm	100	New	1
Ox-Acet. Welder	BOC	90	Good	1
Welder, Elec.	ESAB, 180amp.	100	Ex.	1
Other Tools	Local	100	V.G.	varies
		98% Ave.		
		98% Total Ave.		

TABLE C-4. FARM EQUIPMENT SUPPLIED TO OPERATE THE ARUSHA FOUNDATION SEED FARM 1975

ITEM	MAKE & MODEL	ESTIM'D AGE	CONDITION RECEIVED	REPAIR HISTORY	ESTIMATED PARTS AND REPAIR COST	DOWNTIME REPAIRS IN BUSY SEASON	PRESERT CONDITION OR DISPCOSITION
Tractor GTC 835	Ford 4000	6 yrs	Poor	Engine completely rebuilt '73 Replace injector pump & electric	3,000/00	10%	Used mainly to mow, side-dress maize & pull trailer.
Tractor GTC 838	Ford 4000	6 yrs	Very Poor	Engine & hydraulic system rebuilt Shrouding welded.	2,000/00	100%	Needs tires to move. Machine should be retired.
Tractor St 5787	IHC 544	1 yr.	New	Flywheel broke loose (factory fault), Replace clutch plate.	1,000/00	1%	Parts supplied under factory warranty not yet installed.
Tractor ST 5790	IHC 966	1 yr.	New	Replace clutch plate, brake disc and weld muffler	2,000/00	nil	Very good. Need dual wheels to utilize fully.
Tractor ST 5791	IHC 966	1 yr.	New	Broke drawbar housing twice. Repair 3 pt. hitch.	3,500/00	nil	Very good. Bought dual wheel hubs, (29,000/00)
Tractor-Dozer ST 7246	Cat. D3C	1 yr.	Like new	Replace main hydraulic supply line. Straighten radiator door.	1,500/00	nil	Very good. Used both as dozer & field tractor.
Combine ST 6662	IHC 715	1 yr.	New	Feeder shaft welded, wheel studs replaced, elect. wiring wrong, replaced switches & belts.	1,500/00	1%	Very good. Need drive jackshaft bearing.
Truck ST 8456	IHC Loadstar 1700	1 yr.	New	Repair clutch master cyl. 3x. Repair exhaust & electric wiring. Collision body damage repaired	3,000/00	2%	Good. Difficult to start when cold.
Vehicle ST 1066	Ford Bronco	5 yrs	Poor	Complete engine overhaul, new battery.	8,000/00	50%	Very poor.
Vehicle GTC 200	L. Rover S.W.B.	6 yrs	Poor	Complete engine overhaul, new tires, battery, clutch, transmission parts, electrical parts.	8,000/00	40%	Very poor.

Table C-4. FARM EQUIPMENT SUPPLIED TO OPERATE THE ARUSHA FOUNDATION SEED FARM 1975 ...continued

ITEM	MAKE & MODEL	ESTIM'D AGE	CONDITION RECEIVED	REPAIR HISTORY	ESTIMATED PARTS AND REPAIR COST	DOWNTIME REPAIRS IN BUSY SEASON	PRESENT CONDITION OR DISPOSITION
Vehicle ST 6295	Jeep Wagoneer	1½ yrs	New	Engine mounts, exhaust seals, shock absorbers, window glass.	4,000/00	nil	Good, Exchanged for Pick-up.
Vehicle St 6294	Jeep Wagoneer	1½ yrs	Very Good	Engine mounts, exhaust seals, shock absorbers, body repairs.	1,000/00	nil	Good.
Vehicle ST 9352	Jeep Pick-up	New, Sept.	New	None	-	nil	Very good.
Water Bowzer ST 9025	Surplus	10 yrs	Fair	None	-	nil	Fair
Trailer ST 9343	Kasten 4 wheel	new	New	Built box, Extend hyd. line.	2,000/00	nil	Very good.
Trailer ST	M & W 4 wheel	New	New	None	-	nil	Very good. 12 ton
Fork Lift ST 7244	IHC 4500	1 yr.	Good	Unknown, Borrowed from DSM	-	nil	Good, Needs seat renewed. Will return to DSM.
Disc Plows (2)	Ransomes	6 yrs	Poor Very Poor	New disc blades, bearings, seals, furrow wheel assbly, bolts, caps.	6,000/00	25% 100%	Good, Very poor. Scrap only.
Disc Plows (2)	J. Deere	1 yr	New	Frame broke & welded, various bolts	250/00	1%	Very good.
Double Disc Harrow	IHC	3 yrs	New	Replaced 3 spools, welded throughout, various bolts replaced	700/00	10%	Poor
Cultivator (2) Four row	IHC	3 yrs 1 yr	New	Replaced bearings & seals. Straighten shafts & shanks.	300/00	5%	Good. Need six row cultivators.

Table C-4. FARM EQUIPMENT SUPPLIED TO OPERATE THE ARISHA FOUNDATION SEED FARM 1975 ... continued

ITEM	MAKE & MODEL	ESTIM'D AGE	CONDITION RECEIVED	REPAIR HISTORY	ESTIMATED PARTS AND REPAIR COST	DOWNTIME REPAIRS IN BUSY SEASON	PRESENT CONDITION OR DISPOSITION
Offset Disc Harrow	Athens	1 yr.	New	Two new tires, tire vulcanized, hydraulic lines, new bearing	3,000/00	nil	Very good. To be moved to Msirha.
Springtooth Harrow	IHC	1 yr.	New	Supplied cables, weld frame.	500/00	nil	Very good.
Chisle Plow	J. Deere	1 yr.	New	Supplied hydraulic lines and fittings.	500/00	nil	Very good.
Grain Drill	J. Deere	1 yr.	New	Replaced drive chain, spouts.	250/00	nil	Very good.
Maize Planter	IHC Cyclo 400	1 yr.	New	Repaired fert. feed shaft and fittings. Repaired hydraulics.	1,000/00	10%	Very good.
Fertilizer Spreader	Gandy	1 yr.	New	Supplied hydraulic lines.	1,500/00	nil	Very good.
Front-end Loader	IHC 2000	1 yr.	New	None	-	nil	Very good. Bucket and blade are too narrow.
Maize Picker	IHC 2PR	1 yr.	New	None	-	nil	Very good.
Mower (sickle)	IHC 110	1 yr.	New	Replace belt, Idler, blades.	500/00	nil	Very good.
Rotary Hoe	IHC	1 yr.	New	Replace tool bar with 5"x5" bar.	1,500/00	nil	Very good.
Elevator 50'	J. Deere L28	1 yr.	New	None	-	nil	Very good.

Table C-5. SEED PROCESSING EQUIPMENT SUPPLIED 1975

ITEM	NAME & MODEL	ESTIM'D AGE	CONDITION RECEIVED	REPAIR HISTORY	ESTIMATED PARTS AND REPAIR COST	DOWNTIME REPAIRS IN BUSY SEASON	PRESENT CONDITION OR DISPOSITION
Maize Sheller	Ransomes	3 yrs	New	Wrong motor installed	nil	nil	Very good
Maize Sheller	Union Iron	2 yrs	New	The 2 $\frac{1}{2}$ " Axial shaft was bent.	nil	nil	Very good.
Bucket Elevator	Universal B2	1 yr	New	Faulty 1 HP motor.	500/00	nil	Very Good.
Bucket Elev.	Universal D	1 yr.	New	Not used	nil	nil	very good.
Paddle Elev.(2)		New	New	Strengthen braces	nil	nil	Very good.
Cleaner	Crippen H-434	New	New	None	nil	nil	Very good.
Cleaner	Krussen	New	New	Not used, seats cracked	nil	nil	Very good.
Dryer	Hauck DCS-300	New	New	Not used, Need building	nil	nil	Very good.
Seed Treater	Gustafson	1 yr.	New	Not used. Material not available	nil	nil	Very good.
Eng closer	Fiesbean	New	New	Adjustment only. Needles.	nil	nil	Very good.
Bagging scale		New	New	Not used.	nil	nil	Very good.

Table c-6. ARUSHA FOUNDATION SEED FARM BUILDING REQUIREMENTS

BUILDINGS	1973		1974		1975		1976		1977		1978	
	ACTUAL PRESENT	TOTAL	ACTUAL PRESENT	TOTAL	ACTUAL PRESENT	TOTAL	NEW ADDITION	TOTAL	NEW ADDITION	TOTAL	NEW ADDITION	TOTAL
<u>STAFF HOUSES</u>												
Senior Staff	0	0	2	2	3	5	0	5	1	6	0	6
Junior Staff	0	0	2	2	2	4	0	4	2	6	0	6
Drivers/Labour	0	0	0	0	0	0	4	4	4	8	2	10
OFFICES	0	0	4	4	0	4	0	4	2	6	0	6
MACHINE SHED	0	0	1	1	0	1	0	1	0	1	0	1
WATER SUPPLY	0	0	1	1	1	1	Ext.	1	0	1	0	1
SHOP (USAID)	0	0	0	0	0	0	1	1	0	1	0	1
SEED PROCESSING PLANT	0	0	0	0	0	0	1	1	0	1	0	1
DRYER HOUSE	0	0	0	0	0	0	1	1	0	1	0	1
WAREHOUSE	0	0	0	0	0	0	1	1	0	1	0	1

APPENDIX D  
SUMMARY OF INCOME AND EXPENDITURES  
FOR 1975 AND BUDGETS FOR 1976  
MSIMBA AND ARUSHA FARMS

TABLE D-1.

## MSIMBA FOUNDATION SEED FARM SUMMARY OF EXPENDITURE

FINANCIAL:

Financial position from 1st July 1974 to 30th June 1975 was sound throughout the fiscal year. Most of the activities at the station were possible only due to adequacy of funds. Total allocation from Treasury for the development of the farm was Sh. 1.562 m/=.

Summary of expenditure is as shown below:-

	Shs. Cts	Percent of total
Wages	459,705.15	
Transport & Travelling,	27,303.10	29.6
Upkeep of Station		1.8
& Establishments	211,054.95	13.6
Maintenance of Tractors, Equipment & shop	197,673.55	12.7
Maintenance of Motor Vehicles	60,990.25	3.9
Fuel & Lubricants	224,819.50	15.8
Fertilizers, Herbicides & Insecticides	349,862.05	22.5
	<hr/>	
Total sh.	1,551,408.55	
	<hr/> <hr/>	

Estimated return from crop sales based on saleable crop only. Valued seed reserves not included.

Maize (Seed) I.C. 9805 bags x 90	=	882,450	
" I.C. 10430 bags x 25	=	230,750	
Katumani	=	12,375	
Full Yellow (Estimated)	=	63,000	
	<hr/>		
Total seed	1,188,575 x 1.65	=	1,961,148.75
(Milling) estimated 5000 bags x 90	450,000 x -/75	=	337,500.00
Sorghum 2100 bags x 90	= 198,000 x 1.45	=	274,050.00
Bulrush 30½ x 90	= 2,745 x 1.45	=	4,529.25
Soyabeans 355 bags x 90	= 31,950 x 2.25	=	71,887.50
Sesame	1,925 x 2.25	=	5,197.50
		<hr/>	
	TOTAL HS.....	=	2,654,313.00
		<hr/> <hr/>	

TABLE D-1... continued  
 BUDGET AND PLAN OF OPERATION 1975/1976  
 PROJECTED ACREAGE AND BREAKDOWN 1975/1976

Maize	- 1100 acres
Sorghum	- 400 acres
Rice	- 100 acres
Soybeans	- 50 acres
Others (Sesame, millet, cowpeas )	- 50 acres
	- 1700 acres
Total	- 1700 acres

CAPITAL EXPENDITURES

	Total Shs.
a. Water works, pump & pipes (New engine required )	/ 10,000.00
b. Shop repair, installation of Equipment & rewiring	30,000.00
c. Building permanent cribs (Iron sheets, cement, iron pillars lumber, nails, etc.)	100,000.00
d. Machinery storing shed cementing (Requires 35 tons cement, labour stones, etc.)	20,000.00
	160,000.00
Total	160,000.00

SUMMARY OF EXPENDITURES.

a. Land clearing and Destumping	68,760.00
b. Field operation costs	536,000.00
c. Chemical Rates (1) Herbicides	171,000.00
(2) Insecticides	88,860.00
d. Labour Activities	111,822.00
e. Recurrent Expenditure	530,952.00
f. Fertilizer	650,000.00
	2166,394.00
Total	2166,394.00
CAPITAL EXPENDITURES	160,000.00
RECURRENT EXPENDITURES	2166,394.00
	2,326,394.00
Total	2,326,394.00

TABLE D-2. SUMMARY OF INCOME AND EXPENDITURE - Arusha

ITEM	ENTIRE FINANCIAL YEAR 1973-74		ENTIRE FINANCIAL YEAR 1974-75		FIRST AND SECOND QUARTER 1975-76	
	ALLOCATION Shillings 665,000/00		ALLOCATION Shillings 1,640,000/00		ALLOCATION Shillings 770,000/00	
	EXPENDITURE	%	EXPENDITURE	%	EXPENDITURE	%
Wages	87,098/25	13.10	311,682/45	19.4	126,072/15	16.4
Petrol	11,599/50	1.74	16,494/10	1.0	4,457/60	0.6
Diesel	28,988/80	4.36	72,795/30	4.4	14,526/50	1.9
Oil & Lube	2,590/90	0.39	1,824/95	0.1	6,241/30	0.8
Chem-Fertilizer	35,469/60	5.33	572,414/45	35.9	351,661/70	49.5
Seed	20,812/00	3.13	3,000/00	0.2	-	-
Spares & Repair	14,218/70	2.14	19,314/60	1.2	16,648/45	2.2
Hired Transport	28,333/50	4.26	73,554/50	4.5	-	-
Contract Service	19,893/50	2.99	-	-	-	-
Support (T & T)	14,771/10	2.22	19,623/60	1.2	5,986/70	0.8
Tools & Equipment	302/50	0.05	1,400/00	0.1	-	-
Station Upkeep	2,660/70	0.40	4,297/00	0.2	1,459/60	0.2
Irrigation	1,700/00	0.26	-	-	-	-
Building Material	451,299/25	67.86	493,161/65	30.5	197,691/45	25.7
Harvest Supplies	50,000/00	7.52	2,573/65	0.2	1,015/00	0.1
TOTAL	769,738/05	115.75	1,592,136.25	98.9	755,760/45	98.2
+ Unspent			+17,863/75	+1.1	+14,239/55	+1.8
- Overspent	-104,738/05	-15.75				
	665,000/00	100.00	1,640,000/00	100.0	770,000/00	100.0

TABLE D-2...continued

## ARUSHA FOUNDATION SEED FARM

## PRELIMINARY BUDGET 1976

Operational Assuming 1200 acres.

Wages	Shs	250,000/00
Diesel		100,000/00
Petrol		15,000/00
Lubricants		10,000/00
Chemicals and Fertilizer		381,500/00
Spares & Repairs		30,000/00
Harvest & Process		<u>94,000/00</u>
		880,500/00

Recurrent

Transport & Travel	Shs	25,000/00
Telephone & Telegraph		5,000/00
Station Upkeep		30,000/00
Maintenance of plant and vehicles		<u>100,000/00</u>
		160,000/00

Capital

Buildings	Shs	100,000/00
Roads & Security		20,000/00
Soil Conservation		50,000/00
Pipeline Extension		50,000/00
Telephone		<u>10,000/00</u>
		230,000/00

TOTAL

Shs 1,270,500/00

MAIZE Costs per acre

Harrow	40/00
Plough	80/00
Harrow	40/00
Plant	40/00
Cultivate	40/00
Weed	35/00
Fertilizer	300/00
Application	15/00
Cultivate	40/00
Dust	10/00
Rogue	15/00
Harvest	40/00
Drying	15/00
Shelling	10/00
Grade	5/00
Handle	<u>100/00</u>
	810/00

502ac X 810 =	405,820
636 X 715 =	451,740
<u>62 X 370 =</u>	<u>22,940</u>
1200 ac	880,500

WHEAT Costs per acre

Chisle plough	50/00
Plough	80/00
Harrow	40/00
Plant	40/00
Fertilizer	300/00
Manganese	15/00
Spray	30/00
Rogue (3X)	60/00
Harvest	50/00
Handle	<u>50/00</u>
	715/00

BEANS Costs per acre

Harrow	40/00
Plough	80/00
Plant	40/00
Weed (3X)	90/00
Harvest	30/00
Grade	40/00
Handle	<u>50/00</u>
	370/00

## APPENDIX E

- I. SUBSIDIARY LEGISLATION UNDER THE SEEDS ACT
- II. RULES, REGULATIONS AND CERTIFICATION PROCEDURES, TANZANIAN OFFICIAL CERTIFICATION AGENCY
- III. ORRIS SHULSTAD REPORT

Was duly signed by

Hon. J. S. Malecela, Minister for Agriculture on the  
13th December, 1973

Applicable to:

METHODS AND PROCEDURES FOR SEED TESTING AND LIMITS OF VARIABILITY

The purpose of these Regulations and of providing seed analysis results for labelling of seed as required under these Regulations, and for determining the limits of variability of seed analysis results (Tolerance), The International Rules of Seed Testing of the International Seed Testing Association shall be used. (Volume 3 1, Number 1, 1966, 152 pages, or, subsequently published Rules of said Association shall apply).

Analysts, as designated by the Minister of the Tanzania National Seed Testing Laboratory or of any other officially designated seed testing laboratory in Tanzania, shall obtain the results of seed analysis on seed samples submitted for testing by following the above Rules of Seed Testing. The results of seed analysis shall regard as being the official results for labelling purposes as specified by these Regulations.

SEEDS (REGULATION OF STANDARDS)

An act to make provision for the control and regulation of agricultural seed standards and for matters therewith and incidental thereto.

ENACTED BY the Parliament of the United Republic of Tanzania.

The Honorable J. K. Nyerere, President, signed the Act on the 6th December, 1973. This act may be cited as the Seeds (Regulation of Standards) Act, 1973 and shall come into operation on such date as the Minister may by notice in the Gazette, appoint. The Act is basically a truth in labelling law. It requires that seed be fully labelled before it is sold to the ultimate user.

"Seed" means the seed of any cereal, forage, legume, tree, turf, root, vegetable, tobacco, fiber or oil bearing crop grown, sold or offered for sale for the purpose of propagation.

"Sell" includes sell, offer for sale, expose for sale, have in possession for sale and distribute or give away.

"Label" includes the legend, word, mark or design applied for or attached to, included in, belonging to or accompanying any seed or package. The Act regulates all common seed and establishes a Certification Agency to ensure varietal purity of all Tanzania pedigree grades of seed.

"Common Seed" with respect to seed means seed of any kind that has no pedigree status, a variety of which is authorized for sale in Tanganyika.

"Tanzania pedigree grade" means a grade that contains one of the words "breeder", "foundation", "registered" or "certified" as part of the

II. RULES, REGULATIONS, AND CERTIFICATION PROCEDURES  
TANZANIA OFFICIAL CERTIFICATION AGENCY

A. TANZANIA OFFICIAL CERTIFICATION AGENCY

Seed certification was provided for by the 1973 Seeds Regulation Act, Section 5 (a) and subsequent regulations thereto added in 1975. The Agency functions under the Ministry of Agriculture with a Chief Certification Officer and supporting staff, located in a Headquarters at Morogoro and such other sub-headquarters at locations as may be designated by the Ministry of Agriculture.

No other agency, organization or company shall in any way duplicate or attempt to perform the functions of the Tanzania Official Certification Agency within Tanzania.

The Certification Agency performs the duties and functions of seed certification by assigning definite duties and responsibilities to its Headquarters staff, to its Field Inspectors, and to its seed Testing Laboratory staff.

B. DEFINITION OF SEED CERTIFICATION

Seed certification is a system of inspections, using specific field and seed standards, used by a certifying agency, and involving pedigree records on eligible crop varieties, to make available sources of genetically pure seed and propagating materials for general distribution.

Seed certification does this by means of inspections of fields and seeds, and regulations for checking on the production, harvesting, cleaning and storing of each lot of eligible seed

C. THE PURPOSE OF SEED CERTIFICATION

The purpose of seed certification is to maintain and make available to the public sources of high quality seeds and propagating materials of superior varieties so grown and distributed as to ensure genetic identity. Only those varieties that contain superior germ-plasm are eligible for certification. Certified seed is high in varietal purity and of good seeding value.

Varieties eligible for certification have resulted from either natural selection or through systematic plant breeding. In either case, without a planned method for maintaining genetic purity, there is grave danger of losing varietal identity.

Varietal purity is the first consideration in seed certification but other factors, such as weeds, diseases, viability, mechanical injury and grading are also important. One of the most effective methods of preventing the wider distribution of weeds is to plant weed-free seeds. Adverse effects of plant diseases can be reduced by planting clean seed from disease free fields. Properly cleaned and graded seed is easier to plant and gives more uniform stands.

Seed certification, is therefore, designed to maintain not only the genetic purity of superior varieties but also reasonable standards of seed condition and quality.

Without such a system, seeds and propagating materials or crop varieties tend to become contaminated and mixed and to lose identity. The term "Certified Seed" means seed of all of the seed grades: Breeders, Foundation, Registered and Certified. "Certified Seed" refer to seed that has been produced, processed, labelled, and sealed in accordance with the rules, regulations and procedures of the Tanzania Official Certification Agency, or by any other officially recognized seed certification agency outside of Tanzania.

D. ELIGIBILITY REQUIREMENTS FOR CERTIFICATION OF CROP VARIETIES

1. Eligible Varieties

Only those varieties which have been designated by the Seed Production Committee shall be eligible for certification. Such varieties may include public varieties and privately developed varieties. All privately developed varieties shall be evaluated in the manner as usual for evaluating public varieties.

2. Acceptance of Varieties for Certification shall be based on the following:

- a. A statement and supporting evidence by the originator, developer, or owner requesting certification, also that the variety has been adequately tested to determine its value and probable area of adaptation, and that it is distinguishable from other varieties, as set forth in Article 5, International Code of Nomenclature for Cultivated plants which reads as follows:

"The term cultivar (variety) denotes an assemblage of cultivated individuals which are distinguishable by any characters (morphological, physiological, cytological, chemical, or others) significant for the purposes of agriculture, forestry or horticulture and which, when reproduced (sexually or asexually) retain their distinguishing features".

- b. A statement on origin and breeding procedure.
- c. A description of morphological characters (such as colour, height, uniformity leaf, head or flower characteristics, etc.) physiological characteristics, disease and insect reactions, and any other identifying characteristics of value to field inspectors, and such other factors as the breeder or sponsor considers pertinent.
- d. Evidence of performance, including data on yield, insect or disease resistance and other factors supporting the value of the variety. These performance tests may be conducted by private seed firms or Agricultural Experiment Stations, and shall include appropriate check varieties which are used extensively in the area of intended usage.
- e. A statement giving suggested regions of probable adaptation and purposes for which the variety will be used. This should include areas within districts where the breeder of the variety has tested it and anticipates recommending and merchandising it.
- f. Procedure for maintenance of stock seed grades shall be described. At the time a variety is accepted for certification, a sample lot of breeders shall be presented to the Certifying Agency. This is to be retained as a control varietal sample against which all future seed stock released for certified seed production may be tested to establish trueness to variety.

#### E. ELIGIBILITY OF GROWERS

The production of seed for certification is open to producers/growers according to certain qualifications and restrictions set forth by the Government. Both Government Seed Multiplication Farms and Tanzania Seed Company contract producers are presently included in pedigreed grade seed production. Larger numbers of contract

growers are needed to meet the seed needs of the country.

1. Producers of Breeders Seed

The crop plant Breeders of the particular crop variety will produce and provide the necessary Breeders Seed.

2. Producer of Foundation Seed

Foundation seed production is restricted to Seed Multiplication Farms designated by the Ministry of Agriculture.

3. Producer of Registered Seed

Production of registered seed is restricted to registered growers, with good production records and approved by the Official Certification Agency.

4. Producers of Certified Seed

The grade of seed known as Certified Seed will be produced by the Tanzania Seed Company and Seed Multiplication Farms, including contract growers.

5. Training of Seed Producers

The Official Certification Agency shall undertake and carry out such educational work as may be necessary and sanctioned by the Seed Production Committee to train seed producers in all phases of certified seed production and certification. This shall include information on rules, regulations, and procedures, of the Seeds Act and the Certification Agency.

F. QUALIFICATIONS OF SEED GROWERS

1. The Official Certification Agency shall set up qualifications for seed producers and, is obligated to carry on such educational work as may be necessary to train seed production personnel and producers.

2. Qualifications for acceptance of growers should include adaptation of growers' land, equipment, storage and general interest, his ability as a potential grower, his honesty, integrity, and cooperation and other essential qualifications required to conduct a successful seed production programme.

G. GROWERS RESPONSIBILITIES

The various inspections, samplings, labelling and tests minimize the opportunities for carelessness and deception. However, the production and marketing of certified seed depends on the integrity and honesty of the grower and merchant. The Chief Certification Officer or the Chief Inspector, will act on any case where the grower or the person knowingly or intentionally violates the rules and regulations established by the Seed Act or by the Official Certification Agency. Any applicant for services from the Certification Agency whose reputation is unsatisfactory will be refused the services or privileges of the Certification Agency.

Penalties for violations of the Seed Act or of rules and regulations of the Certification Agency are set forth in appropriate sections of the Seed Act.

H. DEFINITION OF SEED GRADES

1. Breeders Grade

Breeders grade means seed recognized by the Director of Crop Development of the Ministry of Agriculture as being seed of a variety that has been produced by the plant breeder responsible for the breeding and maintenance of that variety under conditions which have ensured that the special characteristics of the variety have been maintained and which provides the source for the initial and recurrent increases of seed of the pedigreed grades.

2. Foundation Grade - White Label

Foundation grade means the approved progeny of breeder seed produced by seed growers authorized by the Tanzania Official Certification Agency for the production of this grade and which has been so managed as to maintain genetic purity and identity which provides a source for the initial and recurring increase of seeds.

3. Registered Grade - Purple Label

Registered grade shall be the progeny of breeder or foundation seed that is so produced and handled that the crop meets the standards prescribed as to genetic identity and purity and for which a crop registration certification has been issued by the Chief Certification Officer.

4. Certified Grade - Blue Label

Certified grade means the approved progeny of breeder, foundation, registered, as certified seed so managed as to maintain satisfactory genetic identity and purity, the production of which is supervised and approved by the Tanzania Official Certification Agency and which provides the source for the initial and recurring increase of seeds.

5. Sub-Standard Grade

Sub-standard seed means seed certified by the Chief Certification Officer as sub-standard in accordance with the following conditions:

- a. The seed forms part of a seed lot which does not meet the normal certification standards other than those affecting the genetic purity or the reputation of Certified seed.
- b. The seed is, in the opinion of the Chief Certification Officer, desirable in case of emergency for the advancement of crop improvement.
- c. The certificate or labels relating to the seed clearly show the respects in which the seed does not meet the normal Certification standards.
- d. Notwithstanding the foregoing the seed shall be regarded as re-graded seed of the class which it represents, that is, foundation, registered or certified as the case may be.
- e. That every label and invoice relating to the sale of the sub-standard seed shall bear a stamp or statement indicating clearly that the seed described thereon is sub-standard.

I. LIMITATIONS OF GENERATIONS

1. Except as provided elsewhere in this section, the number of generations through which a variety may be multiplied shall be limited to that specified by the originating breeder or owner of a variety, but shall not exceed two generations beyond foundation seed in Tanzania.

2. The following exceptions to the above limitations of generations are permitted:

- a. Unlimited recertification of the certified class may be permitted for older crop varieties where foundation seed is not being maintained.
- b. The production of additional generations of the certified class may be permitted on a one year basis when:
  - 1. An emergency is declared prior to the planting season by the Ministry stating that foundation and registered seed supplies in Canada are not adequate to plant needed acreage of the variety.
  - 2. Permission of the originating breeder and/or owner of the variety is obtained (if applicable) and
  - 3. The additional generation of certified seed produced to meet the emergency need is declared to be ineligible for certification.

J. DEFINITION OF OFF-TYPES AND OTHER VARIETIES

"Off-types" are plants or seeds which do not conform strictly to the general characteristics of the variety but are described by the breeder as being part of the variety.

"Other variety" includes plants or seeds of the same crop that can be differentiated from the variety being inspected.

K. FIELD AND SEED STANDARDS FOR OPEN POLLINATED MAIZE

1. Field Requirements

- a. Land to be used for the production of Foundation and Certified seed must be free of volunteer crop during the production period.
- b. Isolation: 190 metres from any other maize.
- c. Unit of certification: the entire field shall be the unit of certification and planted with eligible seed-stock.
- d. Field inspections: one or more field inspections shall be made by the Certification Agency during the pollinating period through the harvesting and sorting of the crop.

2. Seed Standards for Pure-Open Pollinated Standards for Each Grade

<u>Factor</u>	<u>Foundation</u>	<u>Certified</u>
Pure seed (minimum)	99.0%	99.0%
Other crop seeds (maximum)	None	None
Total Weed Seeds (maximum)	None	0.01% by weight
Inert matter (maximum)	1.0%	1.0%
Moisture (maximum) <sup>1</sup>	13.0%	13.0%
Germination (minimum)	85%	85%
Other Varieties (maximum) <sup>2</sup>	None	0.50%

- a. Other varieties shall not include variations which are characteristic of the variety or conspecific

III. REPORT OF SEED TESTING AND CERTIFICATION SPECIALIST  
TO TANZANIA SEED MULTIPLICATION PROJECT  
BY ORRIS H. SIJULSTAD

Assignment Period: 19 September 1975 through 9 December 1975

Duty Locations: Dar es Salaam, 22 Sept - 17 October 1975  
Morogoro, 17 October - 2 December 1975  
Dar es Salaam, 2 December - 7 December 1975

Assigned Scope of Activity:

1. Assist and set up operations of seed testing laboratory at Morogoro.
2. Preparation of seed certification program.
3. Advise on additional equipment needed for laboratory operations.
4. Assist project leaders in development of training manuals for seed certification, regulatory services, etc.

A. Additional Seed Laboratory Equipment

A review was made of equipment on hand at the Morogoro laboratory, to be known as the National Seed Testing Laboratory. In consultation with Mr. Joseph Mallya, a finalized listing was prepared, consisting of 78 different items, which was submitted to the project leaders. The list was reviewed by the project leaders and the order had been placed for purchase with USAID.

B. Tangero (Arusha) Seed Testing Unit Study

On November 13, a study visit was made in company with Frank Fanberg, to the Tangero Seed Testing Unit. Tanzanian Ministry of Agriculture officials desired an appraisal of capabilities of the Tangero Unit as a Branch Laboratory to perform all seed analyses and inspections in the Arusha region. A comprehensive report was submitted covering such personnel capabilities, equipment on hand, and needs (23 items), training needs, and additional staff requirements.

C. Preparation of Seed Certification Program

During the first three weeks, a Seed Certification manual was written, embodying some of Mr. Mallya's views, some of the previously prepared manual, and some of the Kenya and Zambia certification requirements. The draft document was submitted to the Seed Production Committee for preliminary review in early November and for final review December 11. Field and seed standards were developed for Open Pollinated Maize, Hybrid Maize, Sorghum, Wheat, Soybean, Millet, and Rice. All necessary rules, regulations, and forms were developed to permit early implementation of seed certification activities.

In addition, pedigree grade seed standards were prepared for all crops listed in the Seeds Act, including cereals, fibre, oil, vegetable, and forage and range crops. Such standards are necessary for use with all imported pedigreed seed under Seed Act Interagency certification requirements, under the First Schedule of the Seeds Act.

Furthermore, common grade minimum standards were prepared for all crops listed in the Seeds Act.

D. Seed Production Committee Proposal

Since this Committee was being referred to under four different names and its makeup of members and its functions should be clarified, a proposal was written to legalize the Committee in the Crop Development Division, Ministry of Agriculture. In particular, the Committee, in addition to other functions, will serve as the Advisory body to the Certification Agency. The Committee adopted the proposal with minor changes.

E. Instructions Manual for Seed Certification Field Inspectors

A detailed manual of instructions for Field Inspectors was prepared for use in training and performance of field inspections. Similar instruction manuals are in use in some Asian countries as well as in states of the United States.

F. Assistance in Operations of Seed Testing Laboratory at Morogoro

Seed analysis and seed technology training was conducted at Morogoro to prepare the three individuals presently assigned to commence seed testing for both pedigreed seed and common grade seed. The training period began 20 Oct. and ended 2 December (about 6 weeks).

Since the intended room for the Laboratory could not be used, all activities were located in a house on the grounds of a Development Institute. Very limited equipment was available. Lack of equipment and samples resulted in slowness of training and trainee performance. However, sufficient training was involved to enable the staff to continue functioning and to permit a beginning in seed certification on the 1976 crop.

The equipment on hand was inspected and repaired. The germinator was judged to be operational but some problem with relay unit noises were to be checked on with Cleland International, Minneapolis, the manufacturer, and advisory sent by consultant to Mr. Mallya.

G. Suggestions for Continued Development

1. Organization staff plan should be developed to:
  - a. serve as basis for implementation of the Certification Agency.
  - b. serve as a basis for recruitment of staff, likely on a phased basis as staff needs exist.
  - c. plan for in-service training of each staff member to perform duties.
  - d. plan a budget
  - e. plan transport purchases
  - f. plan housing needs
2. Overall organization plan for Seed Multiplication Project should be adopted to:
  - a. provide for Manager Foundation Seed Farms
  - b. provide for General Farm Manager
  - c. allow project leaders to train each of the above and to relieve project leaders of unnecessary present responsibilities.
3. Frank Fanberg should train field inspectors for 1976 crop instead of calling in Mississippi State team.
  - a. USAID officials concur
  - b. Fanberg agreed
4. Branch Seed Testing Laboratories must be developed.
  - a. Seed Analyst - cum - Field Inspectors must be trained for maximum efficiency in use of personnel
  - b. Specialist consultant is needed
5. Specialist Consultant should serve the Certification Agency when fully operational at Morogoro:
  - a. after construction of Agency facilities has been completed at Morogoro
  - b. for seed analysis and technology training for all staff
  - c. for training of field inspectors
  - d. consultant likely should live-in and train at Branch Laboratory locations
  - e. consultant should assist with "managing" the Agency to help achieve intended objectives as a certification agency
  - f. confidence needs to be instilled in each staff member to perform duties of position.

II. Debriefing Session with USAID Officials

A debriefing session was held December 5 with Jack Cornelius, Dr. Vernon Johnson, Dr. Richard Podol, Jack Francis, Staley Pitts, and Frank Fanberg attending.

The main items for discussion revolved around:

1. Present capabilities of the Certification Agency
2. Field inspector training
3. Funding matters on the project
4. Need for Mississippi State personnel
5. Accomplishments of Seed Consultant

APPENDIX F  
DETAILED WORK PLANS  
PREPARED BY  
EXPERIENCE INCORPORATED TEAM MEMBERS  
FOR 1976

WORK PLAN 1976  
FRANKLIN N. FANBERG - PROJECT COORDINATOR  
MICHAEL MASHIELLE - CO-PROJECT COORDINATOR

Project Purpose

To establish four (4) foundation seed farms with buildings to house management and staff. Equip each farm with full line of farm machines, seed processing equipment, and buildings to house the same. To establish a National Seed Testing Laboratory and Headquarters Office. To write and edit the seed law rules, regulations and certification standards. Write field and seed inspection manuals as needed. To work with the Tanzania Seed Company in supplying them with foundation seed and provide in-service training of inspectors to inspect their seed fields for certification and to take samples of that seed for testing.

Major Activity Outputs

To produce certified seed for each field planted in Tanzania by planting breeders seed from the Plant Breeders at the research stations. For the production of foundation seed to be planted by the contract growers of the Tanzania Seed Company for the production of certified seed.

Tasks to be Accomplished During the 12-Month Period

1. Task: Establish the Seed Regulatory Service and the Seed Certification Agency
  - A. Date task will be completed: This will take two full crop seasons. It will be one-half completed by December 31, 1976.
  - B. Inputs required to accomplish tasks: In-service training of inspectors to inspect and sample seed. To make field inspections, fill out inspection forms, to interpret the seed law and to know the rules and regulations and understand the certification standards.
2. Task: Establish the Third Foundation Seed Farm in the Coastal Region
  - A. Date task will be completed: It will take two years; we should have one-half of the land cleared and some buildings up by December 1976.
  - B. Inputs required to accomplish task: Start clearing land, building houses and other needed buildings such as seed warehouse, repair shop, machine shed, etc.
3. Task: Supervise the assembling of all equipment ordered under the second loan that all machines and spare parts are delivered to the foundation seed farms.
  - A. Date task will be completed: December 31, 1976

- B. Inputs required to accomplish task: Cooperate with Project Procurement Center and with Government Clearing and Forwarding on moving shipments from the harbor to the company doing the assembling. Supervise delivery by truck of all equipment and supplies to the foundation seed farms.
4. Task: Cooperate with the architects and the building contractors on all seed project buildings.
- A. Date task will be completed: December 31, 1976, except on the third seed farm.
  - B. Inputs required to accomplish task: Make site checks from time to time to insure that the buildings are being built according to the blue prints so far as size and materials are concerned, also see that the contractor stays on schedule, etc.
5. Task: Coordinate all project programs, exercises, etc.
- A. Date task will be completed: December 31, 1976
  - B. Inputs required to accomplish task: Cooperate with the Ministry, USAID, the research stations, the foundation seed farms, and the Tanzania Seed Company -- through communications with all government and industry personnel concerned with the production of certified seed for Tanzania.

WORK PLAN 1976  
SHELDON SANDAGER - MSIMBA FARM MANAGER

The proposed crop plans for seed production on the Msimba Seed Farm are supplemented with a map included in Appendix B.

Another 300 acres of land is to be cleared. Acreage will be expanded to 1700 acres of seed production at the Msimba Farm. An additional 100 acres of rice seed will be grown at the Kilingali Rice Farm under supervision of the Msimba Farm.

The following seed crops and varieties will be planted:

Maize - 1225 acres

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
I. C. White	750	Breeders Seed Ilonga - 1st gen.
Tuxpania	150	Breeders Seed Ilonga Research
Katumani	245	Own Seed - 3rd generation
I. C. Full Yellow	10	Own Seed

Sorghum - 410 acres

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
Serena	200	Foundation - Ukiriguru A. R. I.
Lulu Dwarf	90	Breeders - Ukiriguru A. R. I.
Lulu Tall	30	Breeders - Ukiriguru A. R. I.
Dobbs Bora	90	Own Seed - 3rd generation

Soybeans - 50 acres

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
7H/101	25	Foundation Seed (Ilonga A. R. I.)
3H/1	25	Foundation Seed (Ilonga A. R. I.)

Sesame - 10 acres

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
SSBS No. 4	3	Foundation Seed - (Ilonga A. R. I.)
SSBS No. 7	3	Foundation Seed - (Ilonga A. R. I.)
IMP. Marada	4	Foundation Seed - (Ilonga A. R. I.)

Bullrush Millet - 4 acres

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
Serere	4	EAAFRO Dr. Judy
Composite I		

Finger Millet - 1 acre

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
Composite II		EAAFRO Dr. Judy -3rd gen.

Rice - 100 acres

<u>Varieties</u>	<u>Acres</u>	<u>Seed Source</u>
Kihogo Red No. 23		Foundation - Ilonga
Gamti Tunduru		Foundation - Ilonga
AFAA Mwanza		Foundation - Ilonga
Taiwan No. 14		Foundation - Ilonga
IR8		Foundation - Ilonga

Management Responsibilities are for Functions Listed:

1. Supervision for planning seed crop production and processing plans for a total of 1800 acres of seed crops.
2. Supervision of seed crops as to quality control assuring proper isolation requirements are met. Maintaining the purity of varieties and assuring that the seed produced is within compliance with specifications set forth in the Seed Act.
3. Supervision of cleaning and processing of seed maintaining quality control and separation of varieties to meet specifications set forth on the seed label.
4. Prepare crop production plans, budgets, procurement of inputs and operating within budget constraints.
5. Plan and supervise the construction of permanent maize cribs if capital funds are available.
6. Supervision of seed dryer and processing plant at Msimba contingent upon tender now let for contract.
7. Irrigation plans for 200 acres of land pending report from the irrigation specialists, Ministry of Agriculture, DSM.
8. Supervision and training of mechanics and operators in the maintenance and use of additional equipment arriving under second AID loan equipment order 621-H-017.
9. Selecting additional land and clearing from sisal and bush for expansion of tillable acres in 1977.

10. General improvement and maintenance of facilities.
11. Soil conservation practices, improving drainage ditches and waterways.

#### Summary and Conclusion

In reviewing the past years operation of the Msimba Seed Farm, one might characterize the period as a series of reactions to emergencies in contrast to a well organized and executed plan of operation. However, the most important thing at this time is that the staff and workers did react to the situations as the problems developed. By so doing they developed a sense of teamwork and responsibility and a spirit of enthusiasm that will enable the seed farm to operate, hopefully, on a more professional basis this next year.

The Msimba Seed Farm did perform an important function in producing much of the high quality seed going in to the maize project for Tanzania in 1976. The administrative staff of the Ministry, the Tanzanian staff of Msimba and all the farm workers are to be complimented for their efforts and major contribution made to the developing seed industry of Tanzania.

WORK PLAN 1976

JOHN WAGNER - MSIMBA AGROMECHANIC

The 1976 plan is simply an extension of the one for 1975. Emphasis will be on:

1. Improvements in all areas now handled by agro mechanic.
2. Expansion of service capacity to cope with projected enlargement of equipment fleet and its utilization.
3. Effecting a major order of parts for the new equipment en route.
4. Stabilizing a functional mechanization support unit.

## WORK PLAN 1976

## DUANE ERIKSMOEN - ARUSHA FARM MANAGER

Foundation Seed Farm Objective: To develop and manage a 1200 acre Foundation Seed Farm at Arusha. To reproduce wheat and maize breeder seed without any decrease in quality.

## A. To Develop a Crop Management System:

1. To supervise the timely and adequate preparation of seedbed, planting, fertilizing, spraying, harvest and seed processing of 600 acres of wheat, 550 acres of maize, and 50 acres of beans.
2. To establish the field boundaries, recognizing the requirements of isolation, access, crop rotation, erosion hazard and utility.
3. Compile and verify records on rainfall, fertility, micro-nutrients, disease and insect infestation, weed infestations, bird and rodent depredation.
4. Establish adequate but not excessive labor input levels.
5. Establish a crop rotation system within the confines of the seed crops assigned.

## B. To Maintain the Purity of Seed Under Increase:

1. To establish methods of seed handling during planting, harvest and storage to minimize the possibility of mixture and contamination.
2. To coordinate with the plant breeders at Lyamungu and Ukiriguru on roguing their respective breeder materials.
3. To severely rogue all plant materials in the field at various recognizable stages of growth.
4. To develop systems of field security.

## C. To Develop Farm Administrative Procedures:

1. Set up farm financial procedures in accordance with government procedures.
2. Establish staff positions in accordance with civil service guidelines.
3. Set up administrative records in accordance with government guidelines.

D. To Develop Physical Facilities:

1. To construct two duplex-type units for tractor drivers.
2. Construct the water storage tank.
3. To extend the pipeline to a spring.
4. To establish phase one and phase two of the irrigation system.
5. Supervise the construction of the Farm Shop.

8. Cooperate with farmers interested in contract seed production.
9. Cooperate with Regional and District Agricultural Officers, especially concerned with extension services.
10. Assist local schools with their "Self Reliance Programmes".

G. Provide Training:

1. Provide on-the-job training in farm management to the counterpart position and to a lesser degree to field managers.
2. Provide training in crop husbandry to field managers and their assistants.
3. Provide training in modern farm mechanization to field managers , assistant field officers, field assistants, and others.
4. To recommend outstanding staff members for USAID participant training program.

H. Proposed Cropping Pattern 1974- 1975 - 1976 - see Table B-5.

WORK PLAN 1976

JOHN T. SHORT - ARUSHA AGRO MECHANIC

Project Purpose: The reproduction of seed for the Ministry of Agriculture, Crop Development Division, and the maintenance and repair of all equipment.

Major Activities Output :

1. Assembly, service and repair of all equipment assigned to the seed farm.
2. Preparing schedules of servicing equipment.
3. Keeping inventories of spare parts and tools.
4. Supervision of tool and spare parts room.
5. Preparing and keeping records of all servicing.
6. Organization of work shop to make for more efficiency.
7. Training Tanzanian co-workers in work shop activities.
8. Supervise construction of fencing to enclose grounds.
9. Servicing water supply.

Tasks to be Accomplished:

1. Service and repair all vehicles and equipment
  - a. This is continuous throughout the year.
  - b. Some jobs cannot be done for lack of tools.
2. Servicing the water supply for the farm
  - a. This is a continuing job and depends on the weather.
  - b. Requires two hours or more daily for two men with vehicle.
3. Completion of the tool and store room
  - a. Hopefully this can be completed by March 1, 1976.
  - b. Numerous shelving and containers needed.
4. Supervising on tractors and equipment in the field
  - a. Any time tractors or vehicles are working in the field
  - b. Requires continuous checking
5. Training of co-workers and Tanzanian personnel
  - a. Must be continuous
  - b. Personnel must be sufficient in order to have time for training.

6. Transportation for material and equipment from Dar es Salaam  
As items arrive in Port and each trip requires at least three days travel.
7. Inventory all new tools and spare parts arriving at the farm  
Continuous throughout the year
8. Keep daily records concerning servicing and repair work on all vehicles  
This will be done daily
9. Supervise the building of fences and gates to enclose the buildings and grounds
  - a. To be finished before harvesting time.
  - b. Posts, wire, labor and all materials to be obtained
10. Order spare parts  
To be done continuously as spare parts need to be replaced
11. Set up seed processing machinery  
The seed processing plant remains to be built -- probably the latter part of the year
12. Building of storage tank, and installing of purifier and filter in the water system
  - a. Should be installed by April 1, 1976
  - b. Materials and labor have to be obtained
13. Transferring all tools and spare parts from office to new facilities  
Hopefully this to be done by April 1, 1976.
14. Showing visitors around the farm when appropriate.
15. See that any jobs not noted above are taken care of.