

279-0030
PD-AAG-858 (1)

Eighth
Semi-Annual Report

on

Agency for International Development Negotiated
Contract No. AID/NE-C-1304 (Yemen)

Project No: 279-11-110-030

Contract For: National Sorghum and Millet Crop Improvement

Contents consist of a substantive and administrative report
in accordance with General Provisions, paragraph 12, AID/
1420-23C (7-1-76)

Period of Report: September 16, 1980 through March 15, 1981.
Appendix through May 31, 1981.

Previous Reports: January 15, 1977 through September 15, 1977
September 16, 1977 through March 15, 1978
March 16, 1978 through September 15, 1978
September 16, 1978 through March 15, 1979
March 16, 1979 through September 15, 1979
September 16, 1979 through March 15, 1980
March 16, 1980 through September 15, 1980

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Yemen Chief of Party (2)
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Substantive Report

Status of work and progress under the contract.

The following reports provided in this section portray actual activity:

Dr. Deran Markarian Quarterly Report. He served as the in-country Agronomist/Chief-of-Party and developed the Al Jarubah farm.

Dr. Harnek S. Sandhu, Plant Breeder, Bi-weekly reports from Sana'a.

Dr. Robert L. Voigt, Assistant Technical Director/
Plant Scientist trip report. See Attachment 1.

Edward Lubbers, short term technician, trip report. See Attachment 2.

Mohamed Handy Younes, short term technician, trip report. See Attachment 3.

MEMORANDUM

TO: Charles Ward, Mission Director November 19, 1980
FROM: D. Markarian, COP, Project 030 Sorghum-Millet
SUBJECT: Quarterly Report

This report was due September 30 and since it is overdue it will include the month of October. Activity at the Al Jarubah Farm during the past four months was as follows:

1. The building housing the generator unit was completed including installation of metal door and windows and stucco finish of exterior. A concrete block dock adjoining the building was also completed to facilitate unloading of fuel drums. The generator unit is operational, however, the fuel tank is contaminated with foreign matter causing fuel stoppage. We plan to bypass use of this tank and supply the unit directly from fuel drums on the dock.

Eventually the station should own a fuel truck of at least 2,000 liter capacity. The present method of bringing in diesel by pickup in drums is not efficient.

2. Other physical improvement included the purchase and installation of the new diesel pump motor at the horticulture-village well. This was done in my absence and the effort deserves credit for excellence in engineering layout and workmanship. USAID has suffered three years of criticism for the poor installation of the old unit. We can only hope our critics are equally generous in praise for the new unit. When time is available we will build a structure enclosing the pump unit. The water storage tank for the village was repaired by Achmed Al Gashmi by means of monies collected from the users. The tank does not leak seriously now but the repair can at best be only temporary and a permanent reservoir should be started soon.

3. Most of the terraces on the farm were planted by late August. Harvest of the sorghum-millet trials planted in July were completed by October 1. None of the trial millets compared in performance to the local millet. Twenty-two single plant selections were made from the local planting. Of the 41 introduced sorghums only NK-300 compared favorably to the local varieties in emergence. Unfortunately this is a hybrid variety and seed cost would prohibit its use in the Tihama. It is possible we may recover open pollinated types from the hybrid that will perform well.

The sorghum types grown in the Al Jarubah and adjoining areas are rather rank and dual purpose head and forage types which will grow very tall if watered sufficiently. In contrast, another type is grown along the Taiz highway where irrigation water is available. This type appears more vegetative thus suited to forage production and continuous ratooning. We have a planting of this local type in progress now. It appears for now, at least two distinct adaptive types are used in our area and our breeding efforts should be oriented accordingly.

4. The trial and farming operation for this year was a premature effort as we were and still are only partially complete in our irrigation, leveling, and building program. But a farming show had to be made, most of which was a matter of planting various crops to cover the land and hope for some early information on what would work best for the area. For certain, the best utilization of water will be made by sorghum and secondly millet. Sesame is a question mark but probably will be an important part of the rotation program. The one field we have indicates the crop is well adapted and has the excellent property of shading out weeds thus rendering a method of natural weed control. I have not examined the root system of these plants but suspect that bacterial nodulation is taking place. We found no nodulation in the few soybean plants that survived the rains probably because soil temperatures were excessive since soybeans do not provide coverage as sesame does.

The soybean and guar trials were failures reportedly due to excessive standing water. I do not know why the fields were not drained properly. I see no reason for considering soybean as a crop for the Tihama, however, guar is of considerable interest since a local type does exist. This crop is in high demand in the western world and may present export potential.

We had a field of cotton which failed because of poor planting technique, field preparation, and lack of termite and weed control. This would be a marginal crop many years because of the high water demand. Insect control in the tropics is also difficult and expensive. Our trials with this crop in the future will be limited in size.

We have one field of locally adapted field corn which is doing well. The stand is poor due I think to planting technique, and the field is short of nitrogen which may be corrected at the next irrigation. The demand for corn production in Yemen is or will be high in the future. Broiler producers are looking for local sources. Compared to sorghum or millet, corn if grown in any quantity would likely be a difficult crop because of susceptibility to insects such as the corn borer and termites and high water demand.

The only other crop I had hoped to see this year was peanuts, but it was not planted.

Plans for November and December

A number of urgent items are demanding early attention:

1. Our new well is pumping at about one half its designed capacity. It will be necessary to erect an "A" frame and remove the impellers for examination. Removal and reinstallation will probably require six working days.
2. The village well is drawing air which indicates a need to add one or more sections of pipe to lower the depth of the impellers. This may be only a two or three day operation.

3. Housing in the form of completing the Russian Building must be started. We have completed building the form for pouring the bond beam traversing the length of the building in the center. Rebar will be installed this week and perhaps the concrete will be poured by weekend. I do not visualize a great deal of time involved in construction of the steel trusses or application of the corrugated metal roof. The gable ends will be concrete block with ventilated openings and the eaves will be blocked and cemented to the metal roof. The roof should be complete by month's end and the steel or aluminum doors and windows under contract for construction.
4. Concurrent to the physical development plan it is urgent that the farming operation move ahead. Frankly I will be hard pressed to divide my time to include both. We desperately need capable U.S. technical help in this regard. But, the introduction of additional people also adds to the transportation and housing problem so I am inclined to proceed preferably with the status quo. Arizona indicated two men were being recruited in this area but I am not aware of where the process stands.
5. I have requested Arizona to approve purchase of two suburbans. An additional vehicle is urgent to our operation. The older pickup assigned to Yahia Abdo is in need of repair as spark plugs are fouling frequently. My year-long plan for a competent U.S. mechanic to supervise repair and maintenance of our vehicles unfortunately has never materialized. The only solution I can visualize is simply purchase of new vehicles as needed. If approval for purchase of the above vehicles is not forthcoming soon I will need assistance in solving the problem. If Jeruba is to continue as a USAID responsibility, then as mentioned earlier, a fuel delivery truck is necessary.
6. Moisture for the Tihama has been favorable this year and an above average yield in sorghum and millet should be realized. Our river (The Wadi Rimi) continues to flow at a good rate and if last year's flow is any indication we should have surface water through December at least.
7. We have one additional trial of forage sorghums and sudan grasses to plant this year. As we enter the shorter day lengths and cooler weather our fields as they are readied will be planted to sesame for weed control and soil improvement.

END MEMO

cc: Dr. Phillip Upchurch

- 9/16/80 Irrigation part of tests 80-002 and 80-005
Hand weeding part of test 80-008
Blooming notes in tests 80-001, 80-002 R2 and 80-004.
Bird watching fields A,B and C.
Polination of bagged male sterile plants
Along with Mr. Lubbers and Mr. Younes visited MOA to discuss Al Jarubah problem.
- 9/17/80 Irrigation part of test 80-002 R1 and R2
Hand weeding test 80-021
Blooming notes in test 80-003, 80-005
Crossing male sterile plants
Bird watching fields A,B and C.
Mr. Lubbers went back to Hodeidah
- 9/18/80 Thursday-off
Irrigation part of test 80-012 and 80-002
Hand weeding part of test 80-007
Bird watching fields A,B and C
- 9/19/80 Friday-off
Bird watching fields A,B and C.
- 9/20/80 Irrigation part of tests 80-012, 80-020, 80-023
Hand weeding field C test 80-008
Selfing one-two heads in late maturing entries
Bird watching fields A, B and C
Crossing male sterile plants.
- 9/21/80 Irrigation:- Part of test 80-023. Have to stop the motor due to excessive leakage of oil. Contacted the only VM dealer and found he did not have the needed spares. Inquired at other spare part shops but no luck.
Hand weeding in field A tests 80-001 and 80-019.
Bird watching fields A,B and C
Selfing 1-2 heads in late lines in tests 80-001, 80-002, 80-003.
Lab. Activities: Treated boxes and seed bags with pesticide.
Mr. Lubbers back to Sana'a.
- 9/22/80 Irrigation: Repaired the pump motor. Irrigated part of tests 80-023 and 80-010.
Bird watching fields A,B and C
Hand weeding in field A test 80-018.
Selfing 1-2 heads in late lines in tests 80-004, 80-005, 80-006.
Mr. Lubbers and Mr. Younes visited outreach test Damar.
Percent stand calculation and tabulation of data
Dumping remanent seed from last planting.

- 9/23/80 Blooming notes on late entries in tests 80-003 R1, R2, R3, 80-005; R1, R2, R3 and 80-004 R1, R2.
Height notes in tests 80-006, 80-008.
Irrigation F1 populations in tests 80-007, 80-008.
Prepared blank tables for recording harvesting data
Bird watching in fields A,B and C.
Hand weeding in field B test 80-009.
- 9/24/80 Height notes test 80-005 R1, R2 and R3, test 80-003 R1 and R2.
Irrigation part of tests 80-021, 80-008, 80-017.
Bird watching in fields A,B and C.
Hand weeding in field A test 80-018
Mr. Lubbers left for U.S.
- 9/25/80 Thursday weekend
Irrigation part of tests 80-003 and 80-005
Bird watching fields A,B and C.
- 9/26/80 Friday weekend
Irrigation part of tests 80-009
Bird watching fields A,B and C.
Mr. Younes left for Egypt.
- 9/27/80 Revolution day (holiday)
Irrigation part of tests 80-003, 80-006.
Bird watching in fields A,B and C.
- 9/29/80 Irrigation part of tests 80-003, 80-005, 80-006, 80-009.
Hand weeding part of soybean test.
Bird watching fields A,B and C.
Height notes in tests 80-004, 80-007, 80-017, 80-021
Lab. prepared tables to record 50% blooming dates.
Made selections on the basis of agronomic characters in test 80-005, R1, R2 and R3.
- 9/30/80 Irrigation part of tests 80-003, 80-005, 80-006
Hand weeding part of test 80-013, 80-014.
Bird watching in fields A,B and C.
Height notes in tests 80-003
Director USAID (Mr. Ward) and Ag. Officer Dr. Peterson visited Bir-Al-Gohoume Research Farm.
- 9/28/80 Repaired new pump engine. Replaced fuel pump
Irrigation part of tests 80-009, 80-006
Bird watching in fields A,B and C.
Prepared tables for tests 80-010, 80-012.
Hand weeding part of soybean test.

Harnek S. Sandhu

- 10/1/80 Irrigation: part of tests 80-003, 80-005, 80-006
Bird watching fields A, B and C
Finished height notes of tests 80-003
Visited outreach test at Mabar and took heading notes
- 10/2/80 Thursday weed-end
Bird watching fields A, B and C.
Irrigation: tests 80-003, 80-001
- 10/3/80 Friday week-end
Bird watching fields A, B and C.
- 10/4/80 Irrigation: tests 80-006 rep III
Height notes test 80-002
Percent stand calculation for test 80-006.
Dumped the remnant seed of test 80-001 to make more room available
Visited Al Jarubah farm and assigned work for the next week.
- 10/5/80 Irrigation: part of tests 80-003 and 80-001
Bird watching fields A, B and C.
Height notes test 80-001
Percent stand calculation for test 80-009
Back from Al Jarubah farm.
- 10/6/80 Irrigation: part of tests 80-002, 80-009 and soybean trial
Bird watching fields A, B and C.
Height notes test 80-003
Dumped the remnant seed of test 80-002
Percent stand calculation of test 80-005.
- 10/7/80 Irrigation part of tests 80-014, 80-025, 80-011
Bird watching fields A, B and C
Height notes test 80-005
Percent stand calculation test 80-002
- 10/8/80 Irrigation part of test 80-010, 80-008
Bird watching fields A, Ba and C
Prepared sacks for harvesting early entries.
- 10/9/80 Thursday week-end
Irrigation: part of tests 80-004, 80-007
Bird watching fields A, B and C.
Visual rating of test 80-003 rep I and II
- 10/10/80 Friday week-end
Irrigation part of tests 80-004, 80-007 and 80-021
Bird watching fields A, B and C.
- 10/11/80 Dr. Markarian back in Sana'a.
Irrigation: part of tests 80-021, 80-017
Bird watching in fields A, B and C.
Rearranged seed house to make room for coming harvest.
Visual rating of test 80-002 rep I and II

- 10/12/80 Irrigation: part of test 80-017, 80-008 and soybean test.
Bird watching in field A, B and C.
Rearranged seed house to make room for comming harvest.
Visual rating of test 80-001
- 10/13/80 Columbus Day Holiday
Bird watching in fields A, B and C.
Irrigation: part of tests 80-013 and 80-014.
- 10/14/80 Irrigation part of tests 80-013 and 80-014.
Bird watching field A, B and C.
Visual rating of test 80-005 rep. I and II
Prepared tags and sacks for harvesting early maturity test.
- 10/15/80 Irrigation; part of tests 80-003, 80-005, 80-006 and 80-009
Bird watching fields A, B and C.
Visual rating of tests 80-005 rep III and 80-009 rep I and II
Prepared tags and sacks for test 80-012.

Harnek S Sandhu

Contract No AID/NE-C-1304 Yemen

Activity Report No S 17, Oct. 16-31, 1980

- 10/16/80 Thursday week-end
Dr. Henderson visited Bir-Al-Gohoume research farm.
Local worker did not come to work due to Eid Al-Adha till Oct. 25 only bird watches worked in two shifts. They were paid overtime during these Eid holidays.
On Oct. 18 I accompanied Dr. Henderson and Mr. Arfa on a field trip to Tihama. We visited Al Jarubah Research Farm, Central Research Institute Taiz, Secondary school at Ibb and an outreach test in Damar Governorate
- During this field trip somebody broke into my house and made away with YR.5,000/-cash and personal belongings worth another YR.4,000/- Report has been lodged with police but chances of recovering any thing are remote.
- 10/25/80 Harvested part of test 80-012
Bird watching in fields A, B and C
Single plant selections were made in test 80-005 rep I and rep II and selected heads were harvested
- 10/26/80 Single plant selections were made in test 80-005 rep III
harvested selected heads in test 80-005 rep III
Lines selected for forage yield in test 80-005 were harvested weighted and a sample for dry matter was taken.
Bird watching in fields A, B and C continued.
- 10/27/80 Single plant selected in test 80-009 rep I and II
Bird watching in fields A, B and C.
Selected heads were harvested in test 80-009 rep I and II
Visited Janana outreach test to make harvesting plans
Harvested grain of selected entries from test 80-009 rep I and II
- 10/28/80 Single plant selected in test 80-009 rep III
Selected heads were harvested in test 80-009 rep III
Bird watching in fields A, B and C continued.
Harvested the grain of selected entries from test 80-009 rep III for yield estimation
- 10/29/80 Harvested male sterile open pollinated heads in test 80-008. Seed from these plants will be source for bulk population in 1981 crop.
Hung the harvested heads for drying according to their plot numbers in the head house.
Visited outreach test at Mafnag and found to our surprise that some body stole all the heads.
- 10/30/80 Thursday week-end
Bird watching in fields A, B and C
- 10/31/80 Friday week end
Bird watching.

Contract No AID/NE-C-1304 Yemen

Activity Report No S 18, Nov. 1-15, 1980

- 11/1/80 Tables were prepared to record the final results of such characters as plant height, percent stand and days to 50% bloom for tests 80-002, 80-003
Bird watching in fields A, B and C.
- 11/2/80 Two hundred and forty (240) selections were made from test 80-003 for next year's planting.
- 11/3/80 57 entries from test 80-003 rep I and 42 entries from rep II were harvested for grain and fodder yield.
Bird watching still in progress.
- 11/4/80 Single head selections were made in test 80-001 and were harvested. These selected heads will be tested in head to row plots next year.
Bird watching in fields A, B and C cont.
- 11/5/80 Test 80-006 rep I, 44 selected entries were harvested for grain and forage yield.
Single head selections were made in test 80-006 rep I.
Bird watching in fields A, B and C
- 11/6/80 Thursday week-end
Bird watching in fields A, B and C
- 11/7/80 Friday week-end
Bird watching fields A, B and C.
- 11/8/80 Muslim New year Holiday
Bird watching fields A, B and C.
Dr. Voigt arrived in Sana'a.
- 11/9/80 Test 80-006 rep II selected entries were harvested for grain and fodder yield.
Single head selections were made in test 80-006 rep II
Selections were made in test 80-002 rep I
- 11/10/80 Test 80-002 rep I harvested
Grain of test 80-010 located at Damar was harvested. Dr. Voigt helped in harvesting this test; sacks for forage sample were prepared.
- 11/11/80 Veterans Day - Holiday.
Single head selections were made of test 80-002 rep 2
Bird watching in fields B and C.
Selected heads of test 80-002 rep 2 were harvested.
- 11/12/80 Single head selection and phenotypic rating done in test 80-007 and 80-008. selected heads and selected entries in test 80-002 rep 2 were harvested
Bird watching in fields B and C.
Arranged the harvested heads according to their entry number.

- 11/13/80 Thursday week-end
Bird watching in fields B and C
- 11/14/80 Friday week-end
Bird watching in fields B and C
- 11/15/80 Harvested single heads from tests 80-002, 80-007 and 80-006 were
arranged in the head house.
Harvested grain of outreach test 80-010 located at Jihana.
Bird watching in fields B and C.

Harnek S Sandhu

Contract No AID/NE-C-1304 Yemen
Activity Report No S 19, Nov. 16-30, 1980

- 11/16/80 Arranged the harvested seed of test 80-003 and 80-009
Harvested selected entries for forage yield of test 80-006 rep I and II
Bird watching fields A, B and C.
Accompanied Dr. Voigt to Al Jarubah farm.
- 11/17/80 Harvested 36 selected entries of forage from test 80-003 rep I
Visited Jarubah farm and took notes on test 80-001 and 80-010.
- 11/18/80 Harvested 36 selected entries of forage from test 80-001
Visited Taiz Central Research Institute. Got two plot thrashers
back from FAO. Dr. Voigt loaned these three years ago. Project 030
needed these at Al Jarubah farm.
- 11/19/80 Harvested 28 selected entries of forage from test 80-006 rep I
Arranged harvested entries in head house.
- 11/20/80 Thursday week-end
Harvested another 20 selected entries of forage from test 80-006 rep I.
Made single head and head row selections in test 80-021
Dr. Voigt left for U.S.
- 11/21/80 Friday - week-end
- 11/22/80 Harvested forage of selected entries from test 80-009 rep I
Harvested grain of selected entries from test 80-021
- 11/23/80 Harvested forage of selected entries from test 80-009 rep II
Harvested forage of outreach test 80-010 located at Jahana.
Mechanic Harazi and welder Shaban left for Al Jarubah to help Dr. Markarian
Harvested grain of Pearl millet test 80-017.
- 11/24/80 Harvested test 80-003 rep II
Thrashing harvested test 80-005
- 11/25/80 Harvested, weighed and sampled test 80-006 rep II
Harvested, part of test 80-010 (grain)
Thrashing test 80-005.
- 11/26/80 Thanksgiving holiday
Harvested part of test 80-010 grain
Thrashing part of test 80-005
- 11/28/80 Friday week-end
- 11/29/80 Harvested and weighed forage of test 80-006 rep III
" " " " " " 80-010 rep I
Hung the forage samples in screened drying room.
Thrashing part of test 80-005
- 11/30/80 Harvested and weighed forage of test 80-010 rep II
Thrashing part of test 80-005

Harnek S Sandhu

Activity Report No. S 20, December 1-15, 1980
Contract No. AID/NE-C-1304 Yemen

- 12/1-2/80 Weekend
- 12/3/80 Calculated plant height, percent stand on tese 80-003
Removed the loose Irrigation pipes from Bir-Al-Gohoume research farm and stored at USAID camp ground.
- 12/4/80 Cleaned seed of outreach test 80-010 Jahana location.
Brought field equipment back to camp from Bir-Al-Gohoume Research Farm.
- 12/5/80 Listed the pedigree and source of entries of advanced tests.
Changed the engine oil on tractor and made it ready for next season. Checked the nuts and bolts of plow and leveler.
- 12/6/80 Weighed grains of 100 plots of test 80-010 Sana'a location.
Gave detailed instructions to Mr. Bather, Ministry representative, about calculation of yield and taking test weight.
- 12/7/80 Weighed seed of preliminary yield test and calculated yield on per hectare basis.
Cleaned the seed lab and seed storage area.
- 12/8-9/80 Weekend
- 12/10/80 Plot yield and days to 50% flowering were calculated for test 80-002 and presented in tabular form.
- 12/11/80 Weighed grain of 112 plots of early maturity test.
Thrashed selected heads from 116 entries of advanced yield test.
Rearranged the stored furniture of Ramada North half.
- 12/12/80 Cleaned seed of 55 plots of outreach test Damar location.
Cleaned the room where radio and other equipment is stored.
Took weight of 20 entries of test 80-004.
- 12/13/80 Calculated the corrected yield and tabulated the results of test 80-005, 80-008.
Repaired the big land levelers at Bir-Al-Gohoume and made it ready for Ministry use in Damar area.
- 12/14/80 Remanant seed of 1979 tests was taken out and the desired entries were made ready for storage.
Thrashed 116 entries of outreach test Jahana location.
Received a plot thrasher from Taiz and returned theirs which came to us by mistake.
- 12/15/80 Weekend

Harnek S. Sandhu

Contract No. AID/NE - C- 1304
Activity Report No. S 21 December 16-31, 1980

- 12/16/80 Cleaned seed of 28 plots of test 80 - 007
Weighed grain of 28 plots of test 80 - 007
Thrashed heads from 64 plots of test 80 - 003
Thrashed selected heads from entries 119 - 1125 of test 80 - 003
- 12/17/80 Took test weight of 28 entries of test 80 - 007
Weighed grain of 20 plots of test 80 - 021
Cleaned the seed laboratory
- 12/18/80 Cleaned seed of 44 plots of test 80 - 006 and 57 plots of tests 80 - 003
Thrashed heads from 38 plots of test 80 - 003
Dr. Upchurch and Dr. Matlock visited Bir-Al-Gohoume and German farm at "Amran
- 12/19/80 Friday - weekend.
- 12/20/80 Cleaned seed of 38 plots of test 80 - 003
Thrashed heads from 71 entries of test 80 - 001
Cleaned seed of 37 plots of test 80 - 001
Thrashed selected heads from entries 1127 - 1284 of test 80 - 003
Took test weight of 20 entries of test 80 - 021
- 12/21/80 Cleaned seed of 85 plots of test 80 - 002
Thrashed selected heads from entries 101 - 161 of test 80 - 021
" " " " " 201- 261 of test 80 - 003
" " " " " 2077 - 2121 of test 80 - 003
Thrashed heads from 81 entries of test 80 - 010 (Jahana out reach)
- 12/22/80 Weighed grain from 54 entries of test 80 - 009
Thrashed heads from 38 entries of test 80 - 009
Cleaned seed of 45 plots of test 80 - 010 (Damar out reach)
Thrashed selected heads from entries 2124 - 2198 of test 80 - 003
Dr. Upchurch left for U.S. at 9:45 PM.
- 12/23/80 Thrashed selected heads from entries 2200 - 2284 of test 80 - 003
Dr. Matlock left for U.S. at 0045 AM.
- 12/24/80 - 12/31/80 X-MAS Holiday & weekend
- 12/28/80 Weighed grain of 98 plots of test 80 - 005
Took test weight of 90 entries of test 80 - 005
- 12/29/80 Took test weight of 60 entries of test 80 - 005
Weighed grain of 112 plots of test 80 - 005
Thrashed selected heads from 162 (54x3) entries of test 80 - 006
Showed Mr. Bather, Ministry of Agri. representative how to present data in tabular form.
- 12/30/80 Weighed grain of 38 plots of test 80 - 006
" " " 41 " " " 80 - 001
Took test weight of 28 entries of test 80 - 002

Harnek S Sandhu

Contract No AID/NE - C - 1304 Yemen
Activity Report No S - 22, January 1 -15, 1981

- 1/1/81 January 1, 2, New Year and weekend.
- 1/3/81 Weighed grain of 60 plots of test 80 - 006
Took test weight of 31 entries of test 80 - 001 and 20 entries of test 80 - 006
- 1/4/81 Thrashed selected heads from 88 x 3 = 264 entries of test 80 - 005.
- 1/5/81 Thrashed selected heads from entries 101 - 126 and 204 - 231 of test 80 - 009
Arranged the seed from thrashed heads according to their entry numbers and stored in boxes.
- 1/6/81 Thrashed the heads selected from 162 entries of outreach test 80-010 Damar
- 1/7/81 Thrashed single head selections from entries 101 - 154 of test 80 - 008 and crosses of test 80 - 007
Single selected thrashed heads of test 80-001, 80-005, 80-006 and 80-009 were weighed

1/8/81, 1/9/81 weekend

- 1/10/81 Weighed seeds of single selected thrashed heads of tests 80 - 002, 80 - 006, 80 - 007 and 80 - 021
Calculated yield of tests 80 - 009, 80 - 005, 80 - 006
- 1/11/81 Listed the pedigree and source of test 80 - 001
Calculated days to 50% flowering, plant height and percent stand of test 80 - 009
60 - 70 seed of each entry of test 80 - 003 were put in envelopes for safe storage
- 1/13/81 Calculated the corrected yield and tabulated the results of tests 80 - 009 , 80 - 006, 80 - 007
Prepared the list of selected heads of tests 80 - 005, 80 - 006, -007, -008, -009 and -021
- 1/14/81 Plot yield and agronomic characters of test 80 - 002 were presented in tabular form

1/15/81 and 1/16/81 weekend

Harnek S Sandhu

Activity Report No S 23, Jan. 17 - 31, 1981
Contract No AID/NE-C-1304 Yemen

- 1/17/81 Calculated plant height, percent stand of test 80-002
- 1/18/81 Remnant seed of tests 79-003, 006 and 009 was sampled for storage.
- 1/19/81 Cleaned seed of outreach test 80-010 Damar site
- 1/20/81 " " " " " " " " " "
- 1/21/81 Prepared list along with pedigree of selected entries of test 80-007 and 80-008
Weighed grain of individual plot of test 80-001 Damar site and took their test weight.
- 1/22/81 1/22 and 1/23/81 week-end
- 1/24/81 Prepared list along with pedigree of selected heads from tests 80-002, -003 and -005
- 1/25/81 Weighed forage samples of tests 80-006, 80-009
- 1/26/81 Took test weight and grain yield of test 80-010 out reach test located at Jahana.
- 1/27/81 Thrashed bulk harvest (open pollinated) of test 80-007 and 80-008
Weighed forage samples of tests 80-002 and 80-003
- 1/28/81 Calculated forage yield of tests 80-002 and 80-003
Dumped the forage samples
- 1/29/81 1/29/81 and 1/30/81 Week-end
- 1/31/81 Presented the forage yield data of tests 80-002 and -003 in tabular form.
Weighed forage samples of test 80-001
Remnant seed of test 79004 and 79008 was sampled and stored safely.

Harnek S Sandhu

Activity Report No. S-24, February 1-15, 1981

Contract No. AID/NE-C-1304 Yemen

- 2/1/81 Calculated forage yield of tests 80-002 and 80-003 and tabulated same.
- 2/2/81 Calculated forage yield of tests 80-006 and 80-009 and tabulated same.
- 2/3/81 Calculated forage yield of tests 80-006 and 80-009 and tabulated same.
- 2/4/81 Same work as on 2/3/81
- 2/5,6/81 Weekend
- 2/7/81 Calculated forage yield of tests 80-006 on hectare bases.
Dumped forage sample to make more room.
- 2/8/81 Presented 1980 selected entries in tabular form.
- 2/9/81 Continued presentation of 1980 selected entries in tabular form.
Sorted out entries less than 100 cm tall to put into short grain test in 1981.
- 2/10/81 Made a list of entries that will go into 1981 Head to Row test.
- 2/11/81 Made a list of entries that will go into 1981 Advanced and Elite Yield tests.
- 2/12,13/81 Weekend
- 2/14/81 Prepared seed of short grain advanced yield trial for 1981.
- 2/15/81 Prepared seed of short grain elite yield trial and head rows for 1981 crop.

Harnek S. Sandhu

Activity Report No. S-25, February 16-28, 1981

Contract No. AID/NE-C-1304 Yemen

- 2/17/81 Continued seed preparation of short grain, elite and head row tests for 1981 crops.
- 2/18/81 Searched parents of F_1 populations from 1979 stored seed.
- 2/19,20/81 Weekend.
- 2/21/81 Rearranged tables of tests 80-001, 002, 003, and 005 according to their ranks.
- 2/22/81 Rearranged tables and seed of test 80-006, 80-007.
- 2/23/81 Rearranged tables of forage and grain yield of tests 80-001 and 009.
- 2/24/81 Cleaned the storage space in big room. Moved the cast iron T joints out of the room. Moved the old tires and furniture and rearranged the remaining material and stored in one side.
- 2/25/81 Worked on calculation of grain yield of tests 80-006, 80-009.
- 2/26,27/81 Weekend
- 2/28/81 Arranged and checked the seed of 1981 tests: Preliminary, Elite, Head Row and Advanced Trials.

Harnek S. Sandhu

Activity Report No. S-26, March 1-15, 1981

Contract No: AID/NE-C-1304 Yemen

- 3/1/81 Prepared seed of advanced yield trial for 1981 crop.
- 3/2/81 Assigned the Plot No. to each entry of test 80-004 for 1981 crop.
- 3/3/81 Worked with the short grain advance and short grain elite tests.
- 3/4/81 Cleaned and weighed the seed of test 80-012 (Maize observation trial).
- 3/5,6/81 Weekend

3/7/81 Calculated the yield of test 80-012 (Maize observation trial)

3/8/81 Cleaned and weighed the seed of test 80-017 (Millet Yield Nursery)

3/9/81 Calculated the yield of test 80-017 (Millet Yield Nursery)

3/10/81 Took inventory of room #1.

3/11/81 Checked and recalculated yield of outreach test planted at Jahana and ranked the yield data in tabular form.

3/12,13/81 Weekend

3/14/81 Checked and recalculated yield of outreach test planted at Damar and ranked the yield data in tabular form.
Took the inventory of Room No. 2.

3/15/81 Checked and recalculated yield of outreach test planted at Bir-Al-Gohoume Research Farm and ranked the yield data in tabulated form, took the inventory of Room No. 3.

Harnek S. Sandhu

Plans for Ensuing Period at Al Jarubah, March 16, 1981 - May 31, 1981

1. Through March 30, our efforts were directed only at completing the buildings. One of the two apartments in the mission building was completed except for ceilings which were started and electrical outlets and switches. The bathroom and kitchen were complete and the unit was habitable.

The second apartment lacks kitchen and bath fixtures. Water and sewer were plumbed in.

The generator house was screened to prevent entry of bats.

The new shed for farm machinery storage was started.

2. March 31st we loaded one farm tractor, arc welder, gas welder, cement mixer, and angle iron shears on truck for delivery to Sana'a.
3. April 1, 1981; final pay day, locked buildings, gave key to generator house to Horticulture, project personnel and made final departure. Placed small tools and supplies in Hodeida House.
4. April 2-4; packed and departed for Sana. Left Hodeida House keys and Al Jarubah building keys with USAID, Dwane Hammer.
5. Returned to Arizona for completion of final report through May 31, 1980.

Dr. Deran Markarian

Plans for Ensuing Period at Sana'a, March 16, 1981 - May 31, 1981.

1. Continue with processing of seed and plot data for the 1981 season.
 - a. Seed was prepared for 1981 planting.
 - b. List of tests were prepared for 1981 planting.
 - c. Seed was turned over to a Dutch agriculture farm program.
 - d. Remainder of seed was turned over to USAID Mission personnel.
2. Inventory equipment and supplies, turn all over to USAID Mission personnel.
3. Prepare for departure, housing furniture inventory, turn in of keys, etc.
4. Collect notes for final reports.
5. Depart Sana and return to the University of Arizona for completion of appropriate reports.

Recommendations Covering Current Needs

1. The persistent reason given concerning the inability of the M.O.A. to assign a person to Al Jarubah was the lack of housing. At the time of our departure one apartment unit was habitable immediately.

It is urgent that a Yemini station supervisor be assigned at an early date so that the station be developed and continued. The lack of someone living there will lead to a situation of disrepair and abandonment. A knowledgeable person needs to service the generator, and pump motor.

2. Assuming no further building construction will take place, then the irrigation system needs to be completed and the terraces leveled. Most of the terraces have not been watered for several years and the termite population is excessive. Irrigation, especially prior to planting is one control method.
3. Steel stakes and barbed wire were left on the farm. The area of the buildings should be properly fenced to prevent villagers from using the clearing as a road and gathering place, and also to keep herders from entering with animals.

Dr. Deran Markarian

ADDITIONAL INFORMATION PERTAINING TO THIS CONTRACT

1. Dr. Robert L. Voigt collected purple flowered and white flowered plants from the Al Jaruba farm during his November 1980 visit. These plants were returned to the University of Arizona for positive identification. Dr. Charles Mason of the University of Arizona Herbarium identified these striga plants as Striga hermonthica. This information was returned to the Yemen Chief-of-Party.
2. Mr. Campbell McClusky at Sana'a requested information concerning grasses for higher elevations in Yemen. See Attachment 4 for Dr. Voigt's response to this request.
3. Mr. Carl Schmalzel, University of Arizona Research Assistant for sorghum, traveled to Puerto Rico for approximately one month at the end of calendar year 1980. He assisted in the harvest and field operations of the Yemen sorghum seed collection which was being increased there. Heads were segregated, labeled, bagged and returned to the campus for future use.
4. Mr. Lubbers and Mr. Younes, graduate students from the University of Arizona, completed their short term Yemen tour. They were debriefed and trip reports finalized.
5. Recruitment continued for replacements of Mr. Lubbers and Mr. Younes. Nine applicants were interviewed and screened. James H. Lenhart and Richard Ortega were selected and appropriate processing completed for Yemen travel. Mr. Lenhart departed in January 1981, but Mr. Ortega declined. Mr. Wally Swanson was recruited and departed for Yemen in January 1981.
6. Stanley E. Heathman, Jr. (MS), University of Arizona, was nominated for a Yemen short term assignment as a Weed Control Extension Specialist, but approval to travel was not obtained during the time span he was available to go.
7. Dr. R. P. Upchurch, Head, Department of Plant Sciences/Project Technical Director and Dr. W. G. Matlock, Director, International Programs/Project Campus Coordinator made an administrative visit to Yemen during December 1980. They observed project activities, met with appropriate USAID and Ministry of Agriculture representatives and toured the German farm at Amran. Discussions concerning contract extension and Mr. Yahya Shuga visiting the United States and Puerto Rico also occurred during their stay.
8. Amendment seven to the contract was negotiated and approved during this period. This amendment concerned additional funds and required extensive coordination on campus and with the Agency for International in Washington to determine agreeable levels of spending.
9. Memos for the record from the procurement officer/research assistant are included as Attachment 5 to demonstrate backup support.

10. A Yemen training proposal was prepared at the request of the Agency for International Development in Washington. See Attachment 6 for details of the request and the proposal. This item was not funded.
11. The sorghum heads which were returned from Puerto Rico were threshed, cleaned, categorized, and stored in the Campbell Avenue Farm seed house. A very limited amount of this work was accomplished by student help with Yemen funds. The majority of work on this project was completed by personnel not on Yemen funds. This seed will be introduced to obtain a Plant Introduction (PI) number.
12. Dr. Deran Markarian returned to the United States for an operation during November 1980. He visited the campus 3-5 December just prior to his return to Yemen.
13. Negotiations were in progress at the end of the reporting period for a possible contract extension. Since the outcome of these negotiations was unknown, alternate plans for a rapid close down of Yemen activities were finalized.

Administrative Report

This segment of the semi-annual report covers expenditures and personnel employed under the contract. A report on foreign national trainees is not applicable since the contract does not include any provisions for participant training.

Expenditures

The latest inception to date computer report dated April 4, 1981 is included on the following pages. This report is for the month ending March 31, 1981.

The report is generated by the University of Arizona accounting systems and can be used to determine overall expenditures from inception of contract through March 31, 1981.

BEST AVAILABLE DOCUMENT

REPORT NO. GA3204
ACCOUNT NO. 007301
ACCOUNTANT: J. COJK & P. BROWN
NEXT LEVEL: 000011

UNIVERSITY OF ARIZONA
ITS RESPONSIBILITY REPORT
FOR MONTH ENDING 03-31-81
YEMEN SUPPORT 5010410120

PAGE NO. 1
RUN DATE 04-02-81

MATLOCK W G
036AGI

AGENCY: AID GRANT NUMBER: AID-NE-C-1304 AND B 2000 MTDC AWARD AMOUNT: 1103656 TERMINATION DATE: 04/23/81

***** CURRENT MONTH ***** INCEPTION TO DATE *****

BUDGET CHANGES	EXPLADITURES	ENCUMBRANCES ADDED		BUDGET	EXPENDED	ENCUMBRANCE BALANCE	BUDGET AVAILABLE
			PERSONAL SERVICES & FEE	530,705.00			
	10,532.47	6,579.25	SALARIES				
			SALARIES		387,405.00	5,875.00	305,700.00-
	10,532.47	6,579.25	CLASS TOTAL		387,405.00	5,875.00	
			WAGES				
	140.50		STUDENTS - HOURLY		2,011.00		2,011.00-
	1,430.60	2,507.58	REGULAR WAGES		36,622.00	2,609.00	30,237.00-
	4,300.00		NON-STUDENTS (TEMP)		26,157.00		26,157.00-
	5,871.20	2,507.58	CLASS TOTAL		64,790.00	2,609.00	
			ADJ TO SAL &/R WAGES				
			ADJ TO SAL &/R WAGES		23,791.00		23,791.00-
			ADJUSTMENTS TO FEE		244.00		244.00-
			CLASS TOTAL		24,025.00		
	2,300.88	1,344.59	EMPLOYEE RELATED EXPEND				
			EMPLOYEE RELATED EXPENSE		36,096.00	1,229.00	27,174.00-
			ON NOT USE		249.00		249.00-
			FICA TAX		8,312.00		8,312.00-
			ON NOT USE		11,377.00		11,377.00-
			ON NOT USE		3,702.00		3,702.00-
	2,300.88	1,344.59	CLASS TOTAL		59,735.00	1,229.00	
	19,707.55	10,511.42	CATEGORY TOTAL	530,705.00	537,955.00	9,731.00	16,701.00-

REPORT NO. RA3294
 ACCOUNT NO: 007334
 ACCOUNTANT: J. COTK & P. BROWN
 NEXT LEVEL: 000011

UNIVERSITY OF APITONIA
 LTD RESPONSIBILITY REPORT
 FOR MONTH ENDING 03-31-81
 YEMEN SUPPORT 6010410120

PAGE NO 2
 RUN DATE 04-02-81

MATLOCK W G
 03FAGI

AGENCY: AID GRANT NUMBER: AID-HE-C-1304 AND B 2000 MGDC AWARD AMOUNT: 1193696 TERMINATION DATE: 04/27/81

*** CURRENT MONTH *** ** INCEPTION TO DATE ***

BUDGET CHANGES	EXPENDITURES	ENCUMBRANCES ADDED	BUDGET	EXPENDED	ENCUMBRANCE BALANCE	BUDGET AVAILABLE
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	OPERATING EXPENDITURES		176,700.00			
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	OUTSIDE AND PROFESSIONAL CONSULT-LECTUR/WORKS-EXP			1,523.00		1,523.00-
5,699.56	OPERATIONAL ADVANCE				70,000.00	70,000.00-
	LARGE SVCS FROM O/S AGYS			25,462.00		25,462.00-
	OTHER OUTSIDE + PRINCESS			13,274.00		13,274.00-

5,699.56

5,699.56

	CLASS TOTAL			40,259.00	70,000.00	
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	OFFICE SUPP. AND POSTAGE					
112.60	OFFICE SUPPLIES			1,061.00		1,061.00-
	PRINTED FORMS			140.00		140.00-
19.57	STAMPS STMPD ENV & CARDS			1,986.00		1,986.00-
	POSTAGE- OTHER			506.00		506.00-

112.60

19.57

132.17

	CLASS TOTAL			3,693.00		
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	OPERATING SUPPLIES & SVC					
	RESEARCH SUPPLIES			32,674.00		32,674.00-
10.00	D.P. SUPPLIES - OTHER			305.00		305.00-
	EDUCATIONAL SUP - OTHER			23.00		23.00-
	RECREATIONAL SUP - OTHER			95.00		95.00-
	ANALYSIS SUPPS			10.00		10.00-

10.00

10.00

	CLASS TOTAL			33,137.00		
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	MAINTENANCE AND REPAIRS					
	OFFICE EQUIPMENT			75.00		75.00-
	VEHICLE REPAIRS			1,191.00		1,191.00-
	REPAIRS + MAINT - OTHER			1,015.00		1,015.00-

	CLASS TOTAL			2,271.00		
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REPORT NO. 043204
 ACCOUNT NO: 067381
 ACCOUNTANT: J CUCK & P BROWN
 NEXT LEVEL: 050011

UNIVERSITY OF ARIZONA
 ITS RESPONSIBILITY REPORT
 FOR MONTH ENDING 03-31-81
 YEMEN SUPPORT 5010410120

PAGE NO 4
 RUN DATE 04-27-81

MATLOCK W G
 076AGI

AGENCY: AID GRANT NUMBER: AID-NE-C-1304 AND B 2000 MTDC AWARD AMOUNT: 1193555 TERMINATION DATE: 04/30/81

***** CURRENT MONTH ***** ***** INCEPTION TO DATE *****

BUDGET CHANGES	EXPENDITURES	ENCUMBRANCES ADDED	BUDGET	EXPENDED	ENCUMBRANCE BALANCE	BUDGET AVAILABLE
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			TRAVEL	148,886.00		
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			IN-STATE TRAVEL			
			IN-ST MILGE+VEH PRIVATE	4.00		4.00-
			IN-ST MILGE+VEH ST VEH	1,609.00		1,503.00-
			IN-STATE SUBSISTENCE	214.00		214.00-
			IN-ST REG FEE-CONFERENCE	10.00		10.00-
			PERSONAL EFFECTS TRANS	29,552.00		29,552.00-
			IN-ST OTHER TRAVEL EXP	65.00		65.00-

			CLASS TOTAL	31,454.00		
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			OUT-STATE TRAVL-DOMESTIC			
			OUT/DOM MILGE+VEH PRIVAT	7.00		7.00-
			OUT/DOM SUBSISTENCE	1,613.00		1,613.00-
			OUT/DOM PUBLIC TRANS	2,207.00		3,207.00-
			OUT/DOM REG FEE-CONFERENCE			
			OUT/DOM OTHER TRAVEL EXP	4,861.00		4,861.00-

			CLASS TOTAL	10,388.00		
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			OUT-STATE TRAVEL-FOREIGN			
			OUT/FRN MILGE+VEH PRIVAT	78.00		78.00-
			OUT/FOREIGN SUBSISTENCE	36,901.00	155.00	36,756.00-
			OUT/FOREIGN PUBLIC TRANS	54,424.00	2,538.00	57,232.00-
			OUT/FOREIGN REG FEE-CONF	453.00		453.00-
			OUT/FOREIGN OTHER TRAVEL	453.00		453.00-

			CLASS TOTAL	92,479.00	2,693.00	
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			CATEGORY TOTAL	148,886.00	134,321.00	2,693.00
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						11,872.00
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REPORT NO. GA5204
 ACCOJNT ID: 007381
 ACCOJNTANT: J COOK & P BROWN
 NEXT LEVEL: 00011

UNIVERSITY OF ARIZONA
 TRD RESPONSIBILITY REPORT
 FOR MONTH ENDING 03-31-81
 YEMEN SUPPORT 5010410120

PAGE NO 5
 RUN DATE 04-02-81

AGENCY: AID GRANT NUMBER: AID-NE-C-1304 AND 2000 MDC AWARD AMOUNT: 1193656 MATLOCK W C 036AGT TERMINATION DATE: 04/23/81

***** CURRENT MONTH *****

BUDGET CHANGES EXPENDITURES ENCUMBRANCES BUDGET EXPENDED ENCUMBRANCE BALANCE BUDGET AVAILABLE

BUDGET CHANGES	EXPENDITURES	ENCUMBRANCES ADDED	BUDGET	EXPENDED	ENCUMBRANCE BALANCE	BUDGET AVAILABLE
	CAPITAL		170,247.00			
	EQUIPMENT					
	OFFICE EQUIP + FIXTURES			357.00		357.00-
	RESEARCH, TEST, OTHER TECH			15,634.00		14,534.00-
	INVENTORY EXEMPT			1,579.00		1,590.00-
	EQUIP - FEDERAL TITLE			61,015.00	1.00	61,016.00-
	EQUIP - OTHER TITLE			9,027.00		9,027.00-
	CLASS TOTAL			89,562.00	1.00	
	CATEGORY TOTAL		170,247.00	89,562.00	1.00	80,704.00

INTERNAL CHGS AND ALLGCA						
	INDIRECT COSTS					
	IND COSTS - APPLIED		166,098.00	149,741.00	17,157.00	
	CLASS TOTAL		166,098.00	149,741.00	17,157.00	
	CATEGORY TOTAL		166,098.00	149,741.00	17,157.00	

5,301.74						
5,301.74						
5,301.74						
32,170.45	10,531.42	ACCOJNT TOTAL	1,193,656.00	1,043,347.00	99,582.00	50,727.00

Personnel Employed Under the Contract

September 15, 1980 - May 15, 1981

Dr. Robert P. Upchurch, Head, Department of Plant Sciences, spent 20% of his time as Campus Technical Director.

Dr. W. G. Matlock, Director of International Programs, spent 8% of his time performing duties as Campus Coordinator.

Dr. Deran Markarian, In-Country Agronomist and Chief-of-Party, spent 100% of his time in that capacity in Yemen from September 15, 1980 - March 31, 1981; and 100% of his time in that capacity on campus after April 1, 1981.

Dr. Harnek Sandhu, Plant Breeder, spent 100% of his time in that capacity in Yemen from September 15, 1980 - March 31, 1981; and 100% of his time after April 1, 1981, as Plant Breeder and Assistant Professor on Campus.

Dr. Robert L. Voigt, spent 40% of his time as Campus Assistant Technical Director/Plant Scientist.

A. David Arfa, Edward L. Lubbers, and Mohammed H. Younes served as Extra Technical Help in Yemen until September 30, 1980.

Mr. James Lenhart served as a Technician in Yemen from January 12, 1981 - March 31, 1981; Mr. W. Swanson served as a Technician in Yemen from January 24, 1981 - March 31, 1981.

Mr. Dale E. McDonald, Department of Plant Sciences, spent 32% of his time performing procurement and assigned duties.

Ms. Nancy Ferguson, Research Associate for International Programs, spent 54% of her time from January 1, 1981 - May 15, 1981, doing research and technical writing for the final report on the contract.

Mr. Carl Scaggs, Department of Plant Sciences, spent 24% of his time as a Research Technician.

Mr. Carl Schmalzel, Research Assistant, spent 100% of his time for the period December 29, 1980 - January 25, 1981 on a special assignment under Dr. Voigt's direction.

Daniel Wheeler and Paul Coren, "Work-Study" Students, assisted Dr. R. L. Voigt in various capacities on campus.

2790030005901

Duplicate

Trip Report of TDY to Yemen A.R.

November 5-21, 1980

Distribution:

Contracting Officer (3)
Mission (4)
AID Reference Center (2)
Yemen, Chief-of-Party (2)
Hugh Henderson, Title XII (2)
Dillard Gates, C.I.D. (2)
Barry Bainton, C.I.D. (2)
Director, International Agriculture
Programs (1)
Head, Department of Plant Sciences (1)
Department Plant Sciences File (4)

by

Robert L. Voigt
Department of Plant Sciences
The University of Arizona

Contract No.
AID/NE-C-1304 Yemen

National Sorghum and Millet
Crop Improvement Project No.
279-11-110-030

Table of Contents

1. Purpose of trip
2. Travel schedule and brief in-country daily schedule
3. Current status of Bir Al Gohoume (Sana'a) and Al Jarubah experiment stations and sorghum-millet research
4. Current status of CRSP (Title XII)
5. Current status of 1979 research data and summary
6. Miscellanecus
7. Individual contacts

1. Purpose of Trip

The purpose of this trip to Yemen as Assistant Technical Director/Plant Scientist on this project was threefold:

- a. To observe and become acquainted with the current progress of all sorghum and millet research on this project for the 1980 crop year. I wished to observe the progress made since 1979 and earlier years and get an idea of what the project will be going forward with in 1981.
- b. To determine the current status of the INTSORMIL Coordinated Research Support Program (CRSP) materials that were sent to the mission in February, 1980.
- c. To obtain descriptive and research data of 1979 research work necessary to complete an annual report for 1979. I needed to obtain all informational data on 9 tests and from a small amount to most data on 10 tests. There were no tests for which complete data had been sent to Arizona from Yemen.

2. Travel Schedule and Brief In-Country Daily Schedule

Date

5 NOV 1980 (Wed)	0910	= Leave Tucson by air via St. Louis to Wash., D.C. to obtain Yemen entry visa. Arrive Washington 1700. Stay overnight.
6 NOV (Thurs)	0930	= Obtain Yemen entry visa.
	1000-1300	= Consult with T. Atwood, V. Latif, and K. Sherper in Near East offices of AID/ Washington.
	1330	= To airport. Leave at 1535 via New York for Athens and Yemen.
7 NOV (Fri)	1040	= Arrive Athens, Greece
8 NOV (Sat)	0040	= Leave Athens
	0535	= Arrive Sana'a, Y.A.R. (no suitcase)
	0700	= Arrived CID guest house. A local holiday (new years) and mission closed. No vehicle or driver available to go to farm. Worked on list of activities to be accomplished in Yemen. Dr. Sandhu came over at 1930.

- 9 NOV (Sun) Visual tour of Bir Al Gohoume research and part of field tests. Short 5 minute visit with Dr. Pat Peterson, Agric. Div. Officer before he went to other meetings. Worked on assembly of 1979 research information and data.
- 10 NOV (Mon) To Dahmar (British Unit) to collect research data and assist in making grain harvest of an outreach test of 50 entries in 3 reps. Worked on 1979 report data.
- 11 NOV (Tues) U.S. Holiday for U.S. personnel. Mission closed. No vehicle or driver. Walked to Bank to get money. Worked on 1979 report data.
- 12 NOV (Wed) Visited Bir Al Gohoume research test plots and inspected in more detail with aid of field books.
- 13 NOV (Thurs) Visited Bir Al Gohoume test plots and inspected with aid of field map and field books. An unexpected inspection visit of the farm was made by the Yemen Minister of Agriculture Dr. Ahmed Al Hamadani accompanied by the Director General of the Agricultural Office in Sana'a Mr. Yahya Shuga.
- 14 NOV (Fri) Local "Sunday". Inspected data in 1980 field books. Started preparation of a special report requested by Dr. Pat Peterson on the current status of the sorghum-millet project.
- 15 NOV (Sat) Visited with project technicians. Picked up suitcase from airport. Obtained exit visa on passport. Took Mr. Duane Hammer (USAID) on a 1 1/2 hour tour of research farm as to its strength and weaknesses with a very general description of the sorghum plant and its uses. Lunch with project technicians in one of their homes. Took plant agronomic ratings on some research plots and instructed technicians in this procedure.
- 16 NOV (Sun) Met very briefly again with Dr. Pat Peterson. Traveled to Hodeidah. Visited with Dr. Markarian relative to project and Al Jarubah. Stayed overnight in Hodeidah.
- 17 NOV (Mon) Drove to Al Jarubah experimental farm. Saw IBB school damaged house trailers while enroute. Traveled on to Taiz to stay overnight.

- 18 NOV (Tues) Visited British Mechanization Unit, UNDP/FAO, and IBB school. Returned to Sana'a arriving about 1630. Worked on report for Dr. Peterson.
- 19 NOV (Wed) To citibank for money to pay bills. Reconfirmed reservations at TWA and Yemen Air. Had xeroxing done at AYATA. Packaged sorghum & millet seed for shipment to Arizona. Inquired about Dr. Abdul W. H. Agbary. Visited with various mission personnel. 1 1/2 hours conference with Mr. Shuga.. Dinner with Dr. Sandhu and Mr. Ron Hammersley of Mission Comptroller Office.
- 20 NOV (Thurs) Visit Bir Al Gohoume research farm. Checked on model numbers of planter units so proper seed plates could be ordered. Checked over other project equipment. Re-confirmed air reservations with Yemen Air. Packed. Leave Sana'a at 2200.
- 21 NOV (Fri) Arrive Athens at 0205. Leave Athens at 1245. Travel via NYC and Chicago, arrive Tucson 2340.

3. Report on Current Status of the Sana'a Experiment Station

Dr. H. Patrick Peterson, Head, Agricultural Division, USAID requested a brief summary of the current status of the field research of 030. This report is attached to this trip report as Attachment Two.

Additional comments relative to the Sana'a Experiment Farm:

- a. On Thursday morning, 13 NOV., the Minister of Agriculture, Dr. Ahmed Al Hamdani visited the Sana'a Research Farm (Bir Al Gohoume) for about a half hour. He was accompanied on the visit by Mr. Yahya Shuga, Director General of the Agricultural Office in Sana'a. The purpose of their visit was for the MOA to actually see and get a feel for the general condition of the farm site. He was not interested in details of the research and testing program. Mr. Shuga conducted most of the tour in Arabic. The Minister asked a few questions of Dr. Sandhu and myself. This was a "surprise" visit in that no previous scheduling had been made for the visit.
- b. The current harvest of field research materials at Bir Al Gohoume seemed to be running behind schedule relative to the maturity and dryness of the plant materials. The detrimental part of such a situation was that the leaves were falling off thus preventing their being harvested accurately as may have been possible when the plants were still partly green. A lack

of field laborers probably contributed to this delay. Delays in the harvest of any unbagged heads contributed to additional bird damage with accompanying increased grain yield variation.

4. Report on Current Status of the Al Jarubah Experiment Station

A general statement of current progress of the development of this station is in Attachment Two.

Additional comments relative to the Al Jarubah Experiment Farm:

- a. The U.S. Ambassador to Yemen, Ambassador Lane, is scheduled to visit the Al Jarubah station on December 4, 1980 and will be accompanied by Dr. Peterson of USAID.

5. Status of request of USAID and the Yemen Ministry of Agriculture to Collaborate in a Title XII CRSP Agreement

I met with Dr. Peterson on Sun., NOV 16 relative to the status of the CRSP information that was mailed to USAID Yemen in FEB 1980. Dr. Peterson recalled seeing the documents but he had no information as to what if anything had been done. I left additional copies of some of the documents with Dr. Peterson for use by USAID and the MOA. Dr. Peterson suggested that Mr. Sharif Adin, General Director for Agriculture may be the appropriate contact official in the Ministry.

I discussed the CRSP with Dr. Hugh Henderson, 052 Chief of Party nominee and supplied him with copies of some of the documents so that he would be familiar with our proposed activities.

6. Acquisition of 1979 Data Necessary to Complete the Annual Report

Various 1979 informational items were obtained from project files at the USAID mission which are necessary to complete a report for the 1979 season. The 1979 field books were taken to the U.S. so that large amounts of detailed data could be taken from them for the report.

7. Miscellaneous Activities

- a. I verified the recent return in the last few weeks of a small tractor - mounted leveling blade to the British Mechanization Unit in Taiz. I had borrowed this equipment about January of 1978 and tried to return it before I left in early 1979. Other people in USAID and on this contract kept the equipment for further use. The British finally picked up the blade themselves from Al Jarubah but the wheel was missing. Written requests from the British Embassy were being delivered to Dr. Sandhu asking for the missing wheel. One of these requests was in my presence during this TDY. Mr. Yahya Abdo found the wheel and returned it. I called on the Taiz project Manager, Jim Williams and the shop foreman, Mike Facer to be sure that this equipment had finally been returned and acknowledged. I located a new tire and tube for this equipment in the 030 project storage area in Sana'a and left instructions for Dr. Sandhu to get these items to the British.

- b. The UNDP/FAO at Taiz had borrowed two research threshers prior to my departure from Yemen in 1979. Since then they had borrowed a third thresher but apparently gave no receipt to our project. On 18 NOV we used the receipt for two threshers to retrieve the two most expensive threshers. I found the third thresher in the UNDP work areas in such a poor condition with broken and missing parts that it was not worth trying to retrieve. The two threshers we got back had both been badly misused and will need extensive repair. These two threshers were taken to Al Jarubah by Dr. Markarian. With recent changes in UNDP officials and without a receipt for the third thresher we could not convince them to return a third one.

8. List of Individual Discussions

- a. Dr. Hans Patrick Peterson, USAID Agricultural Development Officer (ADO). I had a brief (about 5 minutes) discussion on 9 NOV between his many other meetings. We discussed very briefly the purpose of my TDY to Yemen.

There was considerable difficulty in arranging a time for a second and more detailed conference prior to my departure. There were two holidays plus out of town trips and other meetings for both of us. We did visit for about 20 minutes on 16 NOV. We discussed the CRSP pending agreement, the upcoming visitation dates of Drs. Matlock and Upchurch, the current and future development schedule of Al Jarubah, the scheduled visit of Ambassador Lane to Al Jarubah on 4 DEC and the Yemen Sorghum Collection. Dr. Sandhu accompanied me to both of the conferences.

- b. Mr. Yahya Shuga, Director General of the Agricultural Office in Sana'a. I met with Mr. Shuga for about one hour on 19 NOV. We discussed the past, current and probable future activities of development of sorghum and millet in Yemen. Dr. Shuga expressed a definite interest in making a TDY trip of about 10 days to Puerto Rico in early January for the purpose of observing the grow-out of a portion of the Yemen Sorghum Collection. In fact he seemed to already have started planning his work schedule around such a trip.
- c. Dr. Hugh Henderson, Chief of Party for 052 and acting Administrative Officer of 030. I had occasion to visit several times with Dr. Henderson about 030 project activities since we were both staying at the guest house. I explained about the CRSP and the desires of Arizona to collaborate with Yemen as a LDC. I gave him copies of appropriate materials so that he would be fully aware of the current status of the linkage development. Dr. Henderson reviewed the first draft of my brief report to Dr. Peterson (Attachment No. Two of this report) and made several very appropriate suggestions.

- d. Mr. Barry Bainton, Deputy Director of CID. I had occasion to visit with Mr. Bainton regarding the current status of 030 field research since we were both staying at the guest house in Sana'a.
- e. Dr. David Arfa, previously acting Administrative Officer for 030. Dr. Arfa met me at the airport and attended to administrative details regarding my passport and return ticket after my arrival. We discussed the objectives of my TDY trip and any support that would be needed to accomplish them. Dr. Arfa left for the U.S. prior to my departure.
- f. Mr. Duane Hammer, USAID TDY to the Mission Agricultural Division. I explained the objectives of 030 in Yemen and something about the sorghums to be found in Yemen and their uses. On another occasion I took him on a one and one half hour tour of the Bir Al Gohoume farm.
- g. I called on Mr. Harry Johnson, Mission Training Officer. His schedule did not permit any lengthy or detailed discussions.
- h. Mr. Tracey Atwood, Near East Bureau, AID Washington. I stopped to visit with Mr. Atwood for about 2 hours on 6 NOV while in Washington obtaining a Yemen entry visa. The current and future status of 030 was discussed.

Attachment One

List of 1980 Tests Planted at Bir Al-Gohum Research Farm

<u>Test No.</u>	<u>Test</u>	<u>No. of Entries</u>	<u>Rep</u>	<u>Plot Size</u>	<u>No. of Rows</u>
80-001	Head Rows	450	1	0.75x5m	450
80-002	Preliminary Field Trial I	256	2	0.75x5m	512
80-003	" " " II	284	2	0.75x5m	568
80-004	Early Maturity Trial	22	2	"	44
80-005	Short Grain Field Trial	88	3	1.5x5m	528
80-006	Advanced Field Trial	54	3	"	324
80-007	F1 Populations	71	1	0.75x5m 1.5x5m 1.25x5m	179
80-008	Male Parents	54	1	1.5x5m	54
80-009	Elite Field Tests	31	3	2.25x5m	279
80-010	Out Reach Tests	50	2	1.5x5m	900
80-011	Seed Multiplication	8	4	5.25x5m	224
80-012	Maize Observation Test	24	3	2.25x5m	216
80-013	International Sor. Pre. Field T I	20	3	1.5x5m	120
80-014	" " " " " II	45	3	1.5x5m	270
80-015	Nat. co-op Maize Obser. Test	Seed not received		-	-
80-016	" " Pearl Millet Ob. Test	" " "		-	-
80-017	Pearl Millet Yield Nursery	9	3	1.5x5m	54
80-018	Inter. Pearl Millet Adap. Trial	21	3	1.5x5m	126
80-019	" " " " " 78	21	3	1.5x5m	126
80-020	" " " DM Nur.	50	2	0.75x5m	100
80-021	Sorghum Introductions	54	2	1.5x5m	216
80-023	Inter. Pearl Millet Adap. Trial (79)I	22	3	0.75x5m	66
30-025	" " " " " " II	22	3	0.75x5m	66

Outreach Tests and Their Locations

<u>Test No.</u>	<u>Location</u>	<u>No. of Entries</u>	<u>Rep</u>	<u>Plot Size</u>	<u>No. of Rows</u>
30-010	Al Hasah (Mafhag)	50	2	0.75x5m	100
30-010	Damar	50	2	"	100
30-010	Mahaweit	50	2	"	100
30-010	Jahana	50	2	"	100
30-010	Bany-Maymoon	50	2	"	100
30-010	Radha	50	2	"	100
30-010	Amran	50	2	"	100
30-010	Sana'a	50	2	"	100
30-010	Jarubah Tihad will be planted in August	50	1	"	100
30-010	Jarubah " " " " " "	450	1	"	450

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Duplicate

Attachment Two

On-Site Progress Review
of
Sorghum-Millet Project 030
Sana'a, Yemen Arab Republic

November 8-20, 1980

Contract No.
AID/NE-C-1304 Yemen

National Sorghum and
Millet Crop Improvement
Project No: 279-11-110-030

by

Robert L. Voigt
Department of Plant Sciences
The University of Arizona

(A brief report submitted to Dr. Hans P. Peterson, Head, Agriculture Division, USAID. Sana'a on 19 November 1980 prior to leaving the country)

On-Site Progress Review of
Sorghum-Millet Project 030

by

Robert L. Voigt

November 8-20, 1980

INTRODUCTION

The objective of this contract is to develop a total sorghum and millet improvement program for Yemen. This means the construction of at least three experiment stations and laboratories for different environments such as low, mid and high elevations. Much necessary equipment and supplies must be acquired to outfit the experiment stations and laboratories. Most important is the availability and training of technical personnel at all levels. The original project review report indicated a minimum of 20 years to get all of this in place and operating assuming no great delays. A constant flow of improved sorghum and millet genotypes and other agriculture information will come and only come in a steady flow when such a program is in place and operating.

Sorghum and millet are the least risk crops for areas of limited or sporadic moisture. The Sana'a area and other high elevation areas of Yemen grow primarily sorghum on rainfed terraces when rains come early (April, May and June). With later rains barley and wheat are grown. Areas of adequate irrigation are primarily in qat., grapes, alfalfa and vegetable crops with some sorghum. The primary limiting environmental condition in these rainfed terraces is moisture so drought tolerance of the sorghum crop is the major required attribute.

RESULTS AND OBSERVATIONS OF PROJECT ACTIVITIES

1. Training of Personnel

This is one of the most important long term objectives of this project. Currently there are no personnel in training outside Yemen. To my knowledge there are none selected.

On-the-job training of project technicians ceased this last year so far as academic classroom instructional back up explaining field research activities. Budgetary restrictions resulted in fewer farm laborers and the performance of many common farm labor duties by our higher level technicians. There was no time for technicians training, and they were actually downgraded in their functions.

2. Experiment Station Development

Sana'a

The output of the two irrigation wells on the Sana'a experiment station dropped about 1/3 in the 1980 season. Adequate irrigation for future needs is in doubt.

Nearby road construction destroyed parts of two experiments in mid-season. This was done without prior notification of any sort.

Claim was laid by a land owner to a large part of Field E and fenced off. It is not clear how this occurred considering the years this land area was occupied and worked by this experiment station with full knowledge and authority of the Yemen Government and USAID.

A modification of irrigation procedure was instituted this year in Field A to shorten the water runs by the use of sub-lateral irrigation ditches through the field. This improved the irrigation water application uniformity in Field A.

The city of Saná'a has essentially grown out past the site of the Sana'a Experiment Station. Urban construction is encroaching on the site to the extent that a new station is needed now.

Al Jarubah

Intensive work has been in progress towards development of the Al Jarubah Experiment Farm for the last 8 to 9 months under this contract. Development in all areas of land improvement, water resource development, buildings and other improvements have been made. Some crop materials have been planted.

There are some further improvement to make before the farm will be declared operational on a limited basis but this is estimated to take only a couple of months more. This work is expected to be completed prior to the expiration of this contract. Progress to date is covered in detail in other reports.

3. On-going Field Research

Sana'a Research Farm

The list of experiments in Attachment One were planned and planted at the beginning of the season. These experiments have been fully described in previous official reports.

There are no specific research results or data to present at this time since collection of field research data and field harvesting is still under-way.

There are more entries in the Elite and Advanced Yield Tests than ever with most all of them showing considerable visual potential. There are many different genotypes with potential for grain, forage or for grain and forage combined (dual purpose).

Good and potentially superior sorghum genotypes are emerging this year, for the first time, from the Sana'a breeding program to off-station testing.

A broader and different off-station testing program to evaluate more potential superior varieties was instituted as suggested last year. Fifty instead of only 4 or 6 are being evaluated in tests on farms and at other research locations. The broad range of environments found even in the high

uplands of Yemen means that no one or two varieties will be best for all production areas. Different areas with differing environments will require different genotypes.

Al Jarubah Research Farm

A limited number of research plots related to the Sana'a program were planted at Al Jarubah, namely 500 different genotypes for adaptation evaluation. A bulk planting of a local combine type sorghum looked good. A field of sesame looked very good. A field of corn had good development but was suffering losses from termites and animals. Cotton and soybean plantings were practically all dead.

CONSTRAINTS

1. Trained Personnel

There is a shortage of trained personnel both in numbers and in level of training. There are practically no prospects of improvement in this basic need in the near future. There is no counterpart with appropriate training and the same problem exists on down to the farm laborer.

2. Experiment Station Development

The Sana'a Experiment Station has continually presented extreme difficulties in growing research plots with precision. The land is unlevel preventing uniformity of pre-plant and later irrigations. Trained personnel and proper equipment to properly level this farm have never been available at the same time to accomplish the job.

Lack of land area and irrigation water prevents a rotation with alfalfa to improve the soil condition.

The Al Jarubah Experiment Station promises to be operational for 1981 for some field research work. The current sorghum crop looked poor for 3 reasons: the recently leveled land gave much variation in plant development in many areas, no fertilizer had been applied and some areas appeared to have a nitrogen deficiency, and striga was bad in the field and very effectively stunted the growth of many research plots.

There are no building facilities at Al Jarubah for working with or processing field research materials, storing seed, storing research equipment, etc. Most research activities on this farm would have to be generally prepared and conducted from the Sana'a facilities. The Al Jarubah station is only an outlying facility of some central facility with its current development.

3. Research Results

The general appearance of the whole research farm indicated a rather severe moisture deficiency in several areas of some size. More moderate moisture deficiencies existed in approximately over half of the farm. The

areas of severe moisture deficiency were evidenced by reduced heights of the plants to 1/2 to only about 1 meter maximum. Such genotypes under maximum input of water and fertilizer would be 2 and 3 meters in height. Many of the plants did not even head out. Such a severe imposition of moisture stress depressed growth and development of all different genotypes so much that drought tolerance differences were so small that any superior types could not be identified. Under more moderate moisture deficiencies the different plant genotypes express themselves in more easily distinguishable broad ranges of phenotypes from which the better types (drought tolerant) can be selected. No positive results can be obtained from these areas of severe plant stress. The experimental materials under evaluation in these areas are either all being discarded or all will have to be retested next year under more favorable research conditions. This is a great waste of effort and a great loss of experimental materials that have taken several years of work to develop.

These severe moisture deficient areas came primarily from problems of applying adequate water. The problem undoubtedly started with inadequate pre-plant irrigation of the fields. The research farm is poorly leveled and developed for research purposes. Later smaller surface irrigations do not make up for the deeper subsoil moisture supply that should have been put into the soil before planting to give good, deep root development and test the different genotypes to extract water from the soil as the season progresses. A farmer's terrace "harvests" water by runoff from surrounding slopes and builds up a subsoil moisture supply. Such a situation has to be developed artificially on this research station by use of irrigation.

Larger plots instead of smaller, and more replications instead of fewer, is the only way to counter the constraints on precision. This means evaluation of fewer genotypes but any progress indicated is more sure.

There was considerable bird damage on certain experimental materials resulting in great inaccuracy of determining their potential grain yields. Such a loss wipes out some of the gains and progress made in previous years. This degree of bird damage occurred from using too few bird watchers. Only about half the number of previous years was employed. Bird damage in previous years was kept down very low - from zero in most plots to 10 or 15 percent in a few plots which can be estimated and corrected for with only small losses of precision. The losses this year were much heavier and over a greater number of plots. This effort towards economy by laying off bird watchers is very expensive if progress of the project is desired.

4. Other Constraints

An additional challenge (or difficulty) is that "drought tolerance" is one of the most difficult plant characteristics to select for in a crop improvement program. Breeding for superiority under conditions of optimum moisture, fertilizer and temperature is many times easier and quicker.

The production of improved sorghum varieties is the result of a functioning research station and facilities run by trained staff personnel. The previous listed constraints indicate the severe problems and thus slow progress towards attaining one of the most difficult goals of all - drought tolerance.

TRIP REPORT

YEMEN ARAB REPUBLIC

Project 279-0030: Sorghum and Millet

University of Arizona

by

Edward Lubbers

REPORTS DIVIDED INTO FOUR PARTS

1. Generator House
2. Irrigation System
3. Planting
4. Miscellaneous

Period Covered:
July 1, 1980 -
September 23, 1980

Generator House

Concrete floor slab was poured on 7/8. The walls were started to be laid on 7/12. Had to make our own blocks after 7/14 because we weren't allowed to salvage blocks from an old broken building. The generator was placed in the building on 9/17. The lintels were poured on 8/23. Wiring, underground pipe, and fuse box were installed on 8/2 to 8/3. The wall crown was also poured on 8/3. Grounded the fuse box on 8/5. Welded roof trusses 8/18 to 8/20. Installed trusses on 8/27 and the decking was installed on 8/28. The corrugated metal roofing was completed on 9/14. The walls were finished 9/15 to 9/16 and stuccoed by 9/20. Doors and windows were also installed on 9/20.

On the 14th of September, al-Goshme demanded electricity. At first he wanted the generator itself, (He brought 10 people to carry a 2 ton generator away), he then settled on telling us to install an electric line to his house. We don't have the ability or capacity to accommodate him. Other discussions will be delayed until after Markarian returns according to MOA of YARG.

Irrigation Systems

Poured a new concrete base for 024 irrigation pump on 7/9/80. Poor maintenance and alignment in the first place so proper alignment may have solved the problem. A worker installed a different (bent) shaft on this well after the other shaft broke. This caused a great deal of damage because of excessive vibration. Kept attempting to fix and maintain 024 pump until 8/23 when it broke for the last time. A great deal of time was spent in this attempt. A new motor was purchased when our attempts became meaningless. It was installed on 8/31/80. A new concrete base was poured to accommodate the new motor. The placement of the mounting bolts and leveling of the base allowed for an almost effortless installation. The new system functioned very well. The pipe was shortened in the past to stop the shaft breakage but the pump may cavitate if water is drawn too quickly. One main problem was that villagers started the old system at their convenience since this well also supplies drinking water to the village. "Hot wiring" and a screwdriver kept the system running for the greater part of the day. Diesel costs were outrageous! Other villages were finding it easy to go 5 kilometres and get water as they please with no effort. We set up a time schedule to allow the villagers to get water and still not overuse the system. There is NO obligation for us to give water or anything else to the villagers according to Mr. Shuga at the Agriculture Ministry of YARG. The local Agriculture Representative, Ahmed al-Goshme, has given us some problems in this area also. On 8/25, both 024 and 030 irrigation pumps were out of order, the villagers and al-Goshme were assured that as soon as either system was in operation, they would get water. Everyone agreed but later that day, al-Goshme and a few others went to Hodeidah to complain. They said that our Tech, Yahya Adbo, was wholly responsible for not allowing the villagers water. They said nothing about the fact the systems were broken down. Caused some intra-Village problems as well as hampering relationships with the villagers and the farm.

The 030 irrigation pump was operable almost all the time. The system doesn't put out the volume that was specified in the contract. With the equipment that was obtained, the engineer at al-Sonidar and Sons, said that something was wrong. He indicated that a new angle gear head of a higher ratio would

give the specifications that are required but that doesn't fix the real problem. He said that if the pump and angle gear head are brought to Sanaa so he could check them, the problem would be fixed free of charge.

OBO: Angle Gear Head Rapporto (1:1,2) Tiop (R25/4L/24A), Maximum impeller speed - 3900 RPM - from al-Sonidor.

This wasn't done because the water was needed even though the system didn't work efficiently. When demand falls off, this can be done.

The old motor of the 024 irrigation system is to be rebuilt in the near future for use as a spare.

The canal system did not work well with Wadi water because the water came to a different part of the farm than was expected. Irrigation using the Wadi was accomplished, but repairs and revamping are needed for more efficiency and less effort in irrigating the entire farm. This work is under-way.

The field leveling was not completed because of the delay this would cause in planting. This work can be easily accomplished in the off season.

Irrigation canals connecting the Horticulture section are needed. The materials only recently arrived so no action has been taken as of yet. Other methods of getting water to Jami Issa's trees were used successfully.

Planting

Guar: Six U.S. varieties were planted in a observation plot to determine suitability of guar for production in Yemen. Excessive rains drowned many seedling but the plants appear to be compensating somewhat for the sparse stand. Flowering occurred on about 8/24, planting was 7/30, emergence was 8/2. I have found what appears to be wild guar. I would appreciate if wild material could be taken for a germplasm collection later in the year. Guar does have possibilities in Yemen.

Soybeans: Lines of a supposedly daylength insensitive and heat tolerant soybeans were planted 8/23 and 8/25. Again rain drowned a large number of plants. Emergence was slow and variable. I suggest that hand planting introduces too many variables in planting, especially dicots.

Sorghum: Besides the 41 US Sorghum (forage, sugar, and syrup types) test, two experiments of Dr. Sandhu have been planted, 8/30. They have emerged very well despite the rains. We also planted some increase seed of some possible forage typed from the U.S. (Dale and Sumac). Three local varieties and the suggested Sorghum from UNDP (TDA) have been planted or will be planted during September. Red Sorghum should be planted around 9/22. Black, Red Foot, and White Sorghums were planted around 9/13 and 9/3, respectively. A ratooning experiment was started on Black Sorghum plant in March, effect of date of harvest on regrowth of sorghum forage.

Sorghum, Cowpea: A small field was planted to two varieties of cowpea, with and without intercropping with Sorghum. Emergence was ok. Planting was on 9/2.

Corn: Tihama I and Tihama II local corn varieties were planted on 9/5 and 9/1 respectively. Emergence was good.

Cotton: Planted on 8/30, Coker 310, Unorthodox planting but emergence was excellent and the stand was fair.

Millet: A UNDP (TDA) millet (Duokh Tihama was planted 8/30. Emergence was ok. There are previous millet plantings by Markarian.

Sesame: Planted around 9/1. Look ok but I don't know sesame.

Rain hampered planting greatly and did destroy parts of some experiments.

Miscellaneous

Trailer shed roof came loose on one corner. It was repaired. The farm map, the fence, gate and cattle guard, the Russian building, the shower, the tree plantings, and landscaping didn't get done because of their lower priorities. Mohamed Salah hired to bag millet while I'm not there, 50 YR/day and 1 day 1 week equivalence. Seerear and Mohamed Ali raised to 60 YR/day. Yahya said you told him it was ok.

Al-Goshme threatened to kill Salah and/or his sons if they didn't hand over keys to everything. Yahya will fill you in on everything about that. Yahya also lost his wife and a daughter to different diseases within 3 days. Dr. Markarian left 8/4.

cc: Dr. Peterson, AGR
Dr. Sandhu
Mr. Lubbers
Dr. Upchurch, University of Arizona

P.S. I helped with a lot of repairs on equipment for the villagers. We also helped with simple first aid for some of the villagers who were burned, cut, or punctured.

TRIP REPORT

YEMEN ARAB REPUBLIC

BY

MOHAMED HAMDY YOUNES

PROJECT 279 - 0030
SORGHUM & MILLET

UNIVERSITY OF ARIZONA

Period covered July 4, 1980

September 26, 1980

Attachment three

Work was performed at the two location of Project 030, Sana'a and Al Jarubah as follows;

Period of
July 4-6 in Sana'a

Establish residency - meet with the officials people of MOA.

Period of
July 7-13 in Al Jarubah farm

Stake two fields for leveling. Start working on the farm map. Fix and repair the irrigation pump of Project 024. Poured a new concrete foundation for the 024 irrigation pump. Finally, leveled one field using the tractor.

Period of
July 14 - August 19 in Sana'a

Took notes and field observations throughout the following outreach tests (planted during the month of May 1980):

The British farm at Damar; about 75km south of Sana'a.
The Dutch farm at Radha; about 170km southeast of Sana'a.
The German farm at Amran; about 70km northwest of Sana'a.
Bani-Maimon, farmer's field; about 35km northwest of Sana'a.
Jehana; Government farm; about 50km east of Sana'a.
Mefhag; Government farm, coffee Research Station; about 70km southwest of Sana'a.
Bir-Al-Gohoume, Government farm; in Sana'a.

In each test, there are 50 lines of sorghum selected from the previous years. There are 2 replications at each of the following locations; The Dutch farm at Radha, the German farm at Amran, Bani-Maimon, and Ber Al-Gohum. Where there are 3 replications at each of the British farm, Jehana farm and at the Mefhag farm. Consecutive visits to some of these outreach tests were needed in order to spray insecticide, fertilize and/or hoe weeds. I was accompanied by Mr. Mohamed Ba'atter, the MOA counterpart for Project 030, in some of these field trips.

Data were taken on number of hills per plot (emergence), plant heights as short, medium or tall and on plot stand as from very poor to very good.

In general, the out-reach tests at the British farm, Jehana farm and Mefhag farm have very good stand in comparison with the other tests at the German farm, the Dutch farm and Bani-Maimon field, that have very poor stand due to the lack of rain and irrigation water.

At the breeding nursery of Bir-Al-Gohoume, Sana'a, a special attention was given to tag the heads of the promising sorghum lines, through-out the field.

Miscellaneous during this period.

A great deal of time was spent on fixing and repairing the irrigation pump at Bir-Al-Gohoume, it was taken to the shop to ret build the engine. A problem of oil leak was developed after putting the machine back to work. A mechanic from caprari warehouse was hired to fix the problem. Irrigation for Bir-Al-Gohoume farm was almost daily even during the weekends and the Eid Holidays due to the low rainy season of this year.

Assist in translating and writing the annual report of project 030 to the MOA.

Assist in translating and writing the new worker's contracts for project 030.

Buy a new shaft and switch for the Al Jarubah irrigation pump (024 pump). Soybeans planting during the third week of August, 126 different soybean germplasms of different maturity groups plus the day insensitive types and the short season lines were planted in two replications. Very poor germination was obtained from this experiment, due to the method of hand planting and the variation between individual workers. Other reasons for poor germination were low soil moisture, poor aeration and the delay of planting date.

Period Aug. 20-31 in Al Jarubah

Planting

126 lines of soybean germplasms were planted in 3 replications using hand planting methods. Again we had very poor germination due to the method of planting and to the heavy rain that drowned a large number of seeds.

Two sorghum experiments of Dr. Sandhu, exp. 80-001 and 80-010, were planted. Experiment 80-001 has 406 entries, replicated twice, where experiment 80-010 has 59 lines. Other local varieties of sorghum obtained from UNDP (TDA) were planted in different field. Two US forage type lines were also planted for seed increase (Date & Sumac). A ratooning experiment on black sorghum that was planted in the spring was started to study the effect of harvest date on the regrowth of forage sorghum.

Corn, two corn varieties "local", Tihama I (white corn) and Tihama II (yellow corn) were planted in two different field. These varieties were obtained from UNDP (TDA).

Three other fields of sesame, cotton and millet were planted during this period.

Irrigation pumps.

Put a new concrete foundation for the new engine to replace the old one of 024 that was broken down at this time.

Mr. Ahmad Al-Ghashmi, the Agric. representative of Al Jarubah, accused our technician Yahia Abdo that he doesn't want to give water to villagers from the 024 pump. We told him that this pump is broken and we are going to put the new engine within 2-3 days as soon as the concrete base will be hard enough. At the same time we are going to fix the farm irrigation pump (030) and we will schedule two hours per day for the villagers to get the water they need, until we put in the new engine. After we agreed on this, Mr. AlGashmi went ahead to complain again to the governor of Hodeidah and the Agric. representative of Hodeidah.

The new engine was put on the new concrete base on Aug. 31. It is working fine since then, two hours in the morning, another two hours in the afternoon to fill-up the old villager's tank and at any time for the 024 farm.

Period Sept. 1-10 in Sana'a

Take heading date notes from the following outreach fields, Johana, the British farm and Mafhag farm. Again, the stand of these farms look good, and there are some promising lines in each field.

Mr. Tracy Atwood, Mr. Abu Baker and I went to meet Dr. Ali Naman at the MOA in Sana'a to discuss with him 3 main subjects;

1. The training program of Yemeni's overseas.
2. Al Jarubah farm and a possible visit to it.
3. The sorghum and millet project (030) in general.

Sent a truck load of 48 pipes (12") to Al Jarubah farm for the irrigation system.

Period of Sept. 10-15 in Al Jarubah.

Went back to Al Jarubah in response to a cable from Mr. Lubbers, Mr. Al-Ghashmi, the Agric. representative is causing some problems to our workers. According to our workers, Mr. Al-Ghashmi threatened our guard with his gun, on Sunday, Sept. 6 about mid-night, asking for all the farm keys (trailer house, tractors, irrigation pumps, the electric generator and all the farm machines). The workers took the case to the police of Hodeidah and Biet Al-Faqueh, where the police order Mr. Al-Ghashmi not to go to the farm after darkness.

The workers also showed us some damage to the trailer house caused by Mr. Al-Ghashmi, when he was looking for the tech. Yahia Abdo, who went to Taizz to visit his sick family.

Planted another field of local sorghum (Red foot).

On Sept. 14th. Mr. Al-Ghashmi came early in the morning asking us (Mr. Lubbers and I) to provide his house with electricity from the farm generator as he said there was an oral agreement about this. We told him, we can not do any thing about this till we meet with the official people at MOA and AID.

Finishing the roof of the generator house.

Period of Sept. 15 - 26 in Sana'a.

Talked to Dr. Sandhu & Mr. H. Johnson about Al-Ghashmi demands, then met with Mr. Yahia Shuga, the Agric. Director of Sana'a, who wrote a letter to Mr. Al-Ghashmi and told us we are not obligated to provide anything to Al-Ghashmi. Other discussions will be delayed till Dr. Markarian returns.

Visit the British farm at Damar to complete the heading date notes.
Worked on repair and fixed the irrigation pump of Bir-Al-Gohoume.
Write the trip report.

cc: Dr. Peterson, AGR
Dr. Sandhu
Mr. Younes
Dr. Upchurch, University of Arizona



December 19, 1980

Mr. Campbell McCluskey
Sana'a (ID)
Department of State
Washington, DC 20520

Dear Mr. McCluskey:

I have asked our grass breeder and turfgrass management expert, Dr. W. R. Kneebone, to suggest some grass(es) for the higher elevations of Yemen like at Sana'a. This is per your request of me on 19 Nov. 1980 just before my departure.

Following is a list of ten forage grasses with potential for rather specific conditions existing around Sana'a.

<u>Common Name</u>	<u>Scientific Name</u>
1. Kleingrass	<u>Panicum coloratum</u>
2. Buffelgrass	<u>Cenchrus ciliare</u>
3. Blue panic	<u>Panicum antidotale</u>
4. Lehmann lovegrass	<u>Eragrostis curvula</u>
5. Wilman lovagrass	<u>E. superba</u>
6. Atherston lovegrass	<u>E. atherstonii</u>
7. Giant bermudagrass	<u>Cynodon dactylon</u> var. <u>aridus</u>
8. Tall fescue	<u>Festuca arundinacea</u>
9. Tall wheatgrass	<u>Agropyron elongatum</u>
10. Perennial ryegrass	<u>Lolium perenne</u>

Warm season:

- Nos. 1, 2 & 3 = 200 to 1000 mm rainfall production range - greater potential with irrigation.
Nos. 4, 5 & 6 = drier rainfall range of 200 - 500 mm, possibly down to 100 mm with irrigation help in establishment.
No. 7 = irrigation required.

Cool season:

- Nos. 8, 9 & 10 = if maximum temperatures are no more than 90°F and nights are cool (like Sana'a) all might have a chance under irrigation. No. 8 is the "toughest".
Nos. 1, 2, 3, 7 & 9 are reasonably salt tolerant.

Dr. Kneebone suggests that you might look at local bermudas, local natives -- Panicum turgidum and Aristida plumosa.

He said that "Fyking" (a Kentucky bluegrass) is no longer one of the good ones since better ones are available. He suggested that a Kentucky bluegrass called "Adelphi" has a broad general adaptation.

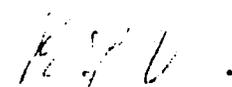
Attachment four

Mr. Campbell McCluskey
Page two
December 19, 1980

Let me know what you think you might want to try and I will see if I can locate a little seed for you.

I hope you had a good holiday season.

Sincerely yours,


Robert L. Voigt
Professor of Plant Sciences

RLV:ew

cc: Dr. W.R. Kneebone
Dr. R.P. Upchurch



THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF PLANT SCIENCES

October 9, 1980

Memo For The Record

From : Dale McDonald *Dale E. McDonald*

Subject: August/September 1980 Yemen Activities

The following backup support was accomplished by me during the months indicated above.

1. Returned a call and visited Ms. Karen Lindblom reference how to breakout monies spent and object codes for amendment five. Reproduced copies of receipts which International Programs had for her use. We eventually determined she did not have enough information available to forecast future expenditures. Brought the problem to the attention of Head, Department of Plant Sciences. Dr. Upchurch visited Ms. Lindblom and helped resolve the problems. A forecast of future expenses was prepared and forwarded to Dave Cleveland, for resolution with the contracts office of USAID/W.
2. Reviewed and made appropriate distribution of Dr. Voigt's annual research report number 1 and 3.
3. Discussed with Don Heckerman the supply problem in Yemen, ie, slowness of customs in Yemen to permit packages to be released. He recommended as many items as possible be hand carried. (We already do this).
4. Made July 1980 telephone and telegram report. None was required for August.
5. Cleaned the area @ CAF in prep for Yemen MOA visit. Met with Jim Wood (CID), MOA officials, Dr. Webster, Dr. Voigt and Mr. Peterson (Ag. Dev. Officer). The Yemen seed collection and its grow-out in Puerto Rico was discussed. Also the fact that 5-8 years could be required to release a new sorghum line.
6. Mr. Scaggs ankle was cut by a rock thrown from a power mower on 11 August 80. He was off a couple weeks with sick leave and a planned vacation. Completed paperwork on above as required.
7. Had three seed screens framed with metal for use in the small thresher used to tresh the Puerto Rico grow-out. Yemen funds were not used.

Attachment five

8. Checked with Purchasing for latest status of NMSU vehicles we are purchasing for them on Title XII. Passed information on to Dave Cleveland per his request. Also met with Purchasing twice to review options per our requisition. General Motors had switched engines on one vehicle and put tubeless tires on the other in their bid. The 350 HP engine has been replaced this year in 1/2T pick-up. A letter was written by Purchasing and acknowledged 19 September 1980 of the correct options. Kept International Programs advised. Both vehicles being built in September.
9. Carl Schmalzel and I fixed the cooler pump in our office area. No funds were required.
10. Reproduced Dr. Sandhu's bi-weekly reports and distributed same, as they arrived.
11. Met with Dr. Deran Markarian as required on his visit to campus 3-5 September 1980. Confirmed his hotel arrangements, discussed semi-annual report requirements and attended meetings with appropriate individuals. Provided transportation to TIA for his departure.
12. Took a signed copy of amendment five which appeared on Dr. Upchurch's desk to International Programs to determine where it should go. Mr. Cleveland took the amendment and stated their office would handle it. Sent a copy of same to Dr. Markarian, Dr. Upchurch, Dr. Voigt, plus my file.
13. Filed cables on MOA requesting some participant training and an answer from Mr. Arfa on negative extension of Mr. Lubbers and Mr. Younges.
14. Met with Dr. Upchurch, Dr. Voigt and Dave Cleveland on the above subjects. Also discussed at meetings with above individuals, Dr. Markarian's visit, recruitment of replacements for Younes and Lubbers, Ms. Lindblom's budget estimates. Also discussed report requirements in accordance with the contract. Annual report is not specified.
15. Noted and returned to Dr. Upchurch a tentative request for monthly reports vice bi-weekly. Present contract specifies bi-weekly.
16. Interviewed applicants for a 90 day Yemen short term tour of duty. Met with Dr. Voigt to finalize our recommendation for the most qualified individuals.
17. Received a check from Tuskegee Institute as final payment of parts I had ordered for them and sent to Yemen. Took the check to Ms. Jorgensen for disposition back into Yemen Title XII funds. Parts were for a tractor stabilizer bar.
18. Picked up a coat for one of the Yemen MOA officials from CID headquarters in Tucson. He had left it in El Paso, Texas and it had been sent here. Forwarded the coat and some sorghum seed to Mr. Jeff Lee, USAID/W. He will insure the items get to Yemen. Dr. Markarian wanted the seed for planting in Yemen.
19. Picked up cables @ Interlibrary loan for Department Head. Cables were from Yemen in a sealed envelope.

20. Mr. Scaggs and I helped proof Dr. Voigt's annual report number two. Made distribution of same after it was finalized.
21. Researched my files for short termer dates in Yemen and Yemen President date of Sana'a visit for Dr. Voigt's use in his reports.
22. Visited benefits section. They had lost my University insurance application on life insurance. Resubmitted same.
23. Received a telegram requesting parts for a pick-up truck in Yemen. Procured same and sent to Dr. Markarian in California who will hand carry back to Yemen.
24. Noted and returned correspondence to Department Head on TDY of Dr. Voigt in October and Dr. Heathman in November, to Yemen.
25. Prepared rough draft of 7th semi-annual report and distributed for correction and addition.
26. Discussed with Dr. Weber the possibility of hand carrying supplies to Yemen, if we have any, when he goes over.
27. Made seven long distance phone calls in support of the project.

cc: R. P. Upchurch
R. L. Voigt
D. Markarian



THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF PLANT SCIENCES

November 13, 1980

Memo For The Record

From : Dale McDonald *Dale McDonald*

Subject: October Yemen Activities

The following backup support was accomplished by me during the month.

1. Coordinated inputs to the seventh semi-annual report, finalized the report, and made distribution of same.
2. Checked on status of the two Title XII vehicles, obtained same and phoned to New Mexico State University International Programs per Dr. Matlock's direction. A total of three calls were made on two status changes. Also forwarded copies of correspondence concerning the vehicles to them along with a memo from me to Ms. Lucero, concerning same.
3. Made telephone report for September.
4. Met with Ms. Lindbloom three times concerning semi-annual report and amendment seven. Wrote a memo to Dave Cleveland on how the \$67,000 from amendment seven should be loaded on CORE.
5. Had a working breakfast with Dr. Markarian, Dr. Voigt and Mr. Lubbers on 9 OCT 80. Took Dee to airport and sent a telegram to the Mission concerning his Sana arrival.
6. Mr. Scaggs bought sockets, crescent wrenches and open/closed end wrenches per Dr. Markarian's direction. I met with Mr. Heathman twice concerning him hand carrying the items to Sana. He did not proceed. Tools to be hand carried by next traveler.
7. Reviewed and returned a letter to Department Head, subject: Insurance to cover shipments in transit.
8. Received and reviewed Dr. Sandhu's bi-weekly reports S-14 and S-15. Included S-14 in the semi-annual report.
9. Received Yemen trip report from Mohamed Hamdy Younes. Corrected grammar and discussed the report with Dr. Voigt. Report was retyped for future use in other reports.
10. Disassembled semi-annual report original pages and returned those I had borrowed. (Inception to date sheets).

11. Wrote August and September Yemen Activities.
12. Discussed with Department Head Yemen subjects such as: reports, amendment seven, funding and possibility of Dr. Markarian purchasing vehicles in Jidda, Saudi Arabia.
13. Wrote Dr. Markarian a memo concerning his tools, amendment five, and the seventh semi-annual report.

cc: Dr. R. P. Upchurch
Dr. R. L. Voigt
Dr. D. Markarian



THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF PLANT SCIENCES

December 12, 1980

MEMO FOR THE RECORD

From: Dale E. McDonald *Dale E. McDonald*
Subject: November Yemen Activities

The following back-up support was accomplished by me during the month.

1. Discuss with Dr. Voigt his trip to Yemen, Lubbers' trip report, etc.
2. Had Dr. Sandhu's bi-weekly reports S-14 and S-15 retyped and made distribution of same.
3. Wrote October Yemen activity report.
4. Repacked tools for Dr. Voigt to hand carry to Yemen. Items procured in October for Mr. Heathman to take, but he did not go.
5. Bought thread reformer die, lug nuts per direction from Dr. Markarian. Sent items to AID/W via air freight at Tucson International. AID/W forwarded items to Yemen. A Shop-Vac motor was also purchased and sent. Processed all invoices, air waybill, etc. on above. One long distance phone call required.
6. Procured two rubber cab support grommets for a Chevrolet C-30 truck and sent via pouch to Mission Director, San'a per a telegram request. Used this address since items weighed less than two pounds. Dr. Markarian and I had previously agreed to try this approach.
7. Received a letter from Dr. Markarian, dated 19 October 80. Had it reproduced and forwarded a copy to Dr. Upchurch and Dr. Voigt.
8. Wrote Dr. Markarian a letter concerning supplies shipped and addresses used.
9. Made two long distance phone calls to locate the Shop-Vac motor. Found the motor in Tucson after identifying a local dealership from Corporation Headquarters in Pennsylvania.

Page Two

10. Made October telephone and telegraph reports.
11. Posted Yemen supply log.
12. Checked on status of AID/W approval to send Mr. Ortega and Mr. Linhart to Yemen. Neither proceeded. Passports and visas were obtained.
13. Looked for some base line studies in Clyde Adams area for Dr. Weber. Found same, Dr. Weber came to CAF and picked up a copy.
14. Met with Dr. Upchurch, Dr. Matlock and Mr. Cleveland on a training proposal for Yemen students. Wrote up meeting contents in outline form.

cc: R.P. Upchurch
R.L. Voigt

DM:mlc

12 January 1981

Memo for the Record

From: Dale E. McDonald

Dale E. McDonald

Subject: December Yemen Activities

The following backup support was accomplished by me during the month:

1. Coordinated inputs and wrote a final version of a Yemen training proposal for Yemen students to attend the U. of A. Dr. Upchurch and Dr. Matlock carried same to Yemen on their visit in December.
2. Discussed Yemen subjects with Dr. Upchurch, as required.
Subjects included:
 - a. Training proposal
 - b. December trip to Yemen
 - c. Pouch system
 - d. Dr. Markarian's return to the States for an operation.
 - e. Mr. Dean replacing Ms. Cunningham at Contacts Office in AID/W
3. Checked on status of N.M.S.U. Title XII vehicle order. Purchasing determined they were shipped 25 November 1980 via a ship named "Rostand." Purchasing advised International Programs, CID and NMSU.
4. Made November telephone and telegraph reports.
5. Made distribution of Dr. Voigt's November Yemen trip report.
6. Received Dr. Sandhu's biweekly report No. 18 and Dr. Voigt's December 19, 1980 letter to Mr. McClusky. Filed both.

cc: Dr. Upchurch
Dr. Voigt



THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF PLANT SCIENCES

February 3, 1981

Memo For The Record

From: Dale E. McDonald *Dale E. McDonald*

Subject: January Yemen Activities

The following backup support was accomplished by me during the month:

1. Discussed Yemen Final report requirements with Dr. Voigt. Met with Ms. Ferguson on same. (Gave her a tour of CAF). Reviewed memo's concerning format.
2. Sent five copies of reports to Ms. Clarissa Douglas, AID/W, who agreed to forward them on to Mr. Hugh Henderson at Sanaa. Reports were titled "A Preliminary Description of the Germplasm Collection of Sorghum Varieties from the Yemen Arab Republic."
3. Received Dr. Sandhu's bi-weekly reports S-18 and S-19, made distribution of same, plus a letter to Mr. McClusky from Dr. Voigt. We have not received reports S-16 and S-17 for October 80. I wrote Dr. Sandhu a memo requesting these reports be forwarded to us again. Dr. Voigt advised.
4. Central Receiving contacted me wanting to know if they could pay for the two New Mexico State University vehicles shipped to Yemen under Title XII in November. Investigation revealed accounts payable had not received the invoice. Proper invoices and shipping data were received by 16 January, Dr. Matlock okayed paying it. I sent a copy of the invoices and shipping documents to Mary Reynolds, NMSU, per her request, via bus. NMSU had personnel departing for Yemen 19 or 20 January and they needed the documents to hand carry. I paid for the bus freight (\$6.45) and NMSU will reimburse me later. (They did). Also advised Dr. Matlock, Accts Payable, Purchasing, Central Receiving of action taken.
5. Checked out conflicting requirements to send some Yemen seed to Mexico for Dr. Voigt. Ended up taking the seed for inspection and obtained a phyto-sanitary certificate, which should let the seed go through the Mexican mail system without being detained.
6. Discuss with Dr. Voigt Yemen short term personnel requirements for Mr. Linhart and Mr. Swanson's scheduled departure of 13 and 27 January 81.
7. Met with Dr. Upchurch and discussed Ms. Ferguson's role in preparing the Yemen final report.

Page 2
Memo
February 3, 1981

8. Made telephone report for December.
9. Received Dr. Markarian's quarterly report to Charles Ward.

cc: Dr. R. P. Upchurch
Dr. R. L. Voigt



THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF PLANT SCIENCES

March 11, 1981

Memo For The Record

From : Dale E. McDonald *Dale E. McDonald*

Subject: February Yemen Activities

1. Visit Ms. Lindbloom reference a requirement for budget figures based on latest CORE and estimates through 31 MAR 1981. Information needed for possible two month extension of contract.
2. Had Dr. Markarian's latest quarterly report retyped. Filed same for future use.
3. Reviewed figures provided in 1 above. They did not contain salary or air fare for Mr. Swanson who departed 24 JAN 1981 for Yemen. Obtained information from Dr. Voigt on same. Ms. Lindbloom re-figured budget and gave to Dr. Upchurch.
4. Filed a copy of a letter from the Contracting Officer to Dr. Matlock, dated 26 JAN 81 concerning: no need to change any report requirements.
5. Reviewed and filed a letter from Dr. Markarian to Dr. Upchurch, dated February 1, 1981.
6. Reviewed and filed a lengthy telegram from Dr. Upchurch to Dr. Sandhu in Yemen concerning contract status.
7. Reviewed and filed a lengthy telegram from Dr. Upchurch to Hugh Peterson in Yemen concerning request for contract extension 'til 31 MAY 81.

DEM/vlh

cc: Dr. R. P. Upchurch
Dr. R. L. Voigt



THE UNIVERSITY OF ARIZONA
TUCSON, ARIZONA 85721

COLLEGE OF AGRICULTURE
DEPARTMENT OF PLANT SCIENCES

April 3, 1981

Memo For The Record

From : Dale E. McDonald *Dale E. McDonald*

Subject: Yemen Activities for March

1. Received an invoice from Purchasing on the New Mexico vehicle purchase. Purchasing wanted to know if they were in Yemen. Contacted Mary Reynolds, NMSU International Programs who advised they had issued a Bank Money Order to the Hodeida freight forwarder and the vehicles were in Yemen. Advised Purchasing of same. Invoice had been paid previously.
2. Filed extra copies of Mr. Lubber's trip report.
3. Read and filed copy of a letter from Dr. Markarian to Dr. Upchurch, on the Yemen project.
4. Received a copy of a letter from Dr. Upchurch and Mr. Matlock to Mr. Peterson concerning a proposed visit by Mr. Shuga to the United States. Filed same.
5. Filed a copy of Dr. Sandhu's January work plan due to his R and R.
6. Discuss the final Yemen report requirements with Ms. Ferguson. Gave her background on Mr. Shuga's stay at the University of Arizona. Compiled a list of publications which were sent to Yemen and a list of publications which we could not obtain for various reasons. Nancy wanted this information for the final report.
7. Filed a telex from Dr. Voigt to Dr. Sandhu concerning 1979 field books.
8. Received a letter from Dr. Sandhu, plus October 1980 bi-weekly reports. Forwarded same to Dr. Voigt and Dr. Upchurch for their review. Made distribution of the reports.

cc: Dr. R. L. Voigt
Dr. R. P. Upchurch

UNCLASSIFIED
Department of State

INCOMING
TELEGRAM

PAGE 01 SANA 06074 081017Z
ACTION AID-35

056219 AID7466

ACTION OFFICE CTR-02
INFO NEPD-03 NEDP-01 CH6-01 NETC-04 NENA-03 GC-01 GCFL-01
GCNE-01 FM-02 CMGT-02 IT-06 CH8-01 RELO-01 MAST-01
0-00 /030 A2 X

INFO OCT-01 /036 W

-----008187 081020Z /34

R 080654Z SEP 80
FM AMEMBASSY SANA
TO SECSTATE WASHDC 4477

UNCLAS SANA 6074

AIDAC

E. O. 12065: NA
SUBJ: 279-0030 SORGHUM AND MILLET TRAINING

REF: SANA 5656

1. SORGHUM AND MILLET PROJECT 030 SCHEDULED TO END MARCH 31, 1981 TRAINING UNDER THIS PROJECT HAS BEEN MINIMAL. MOA HAS EXPRESSED INTEREST IN HAVING UP TO FOUR PEOPLE RECEIVE SHORT-TERM TRAINING BEFORE THE PROJECT ENDS.
2. IT WAS SUGGESTED THAT TRAINING SHOULD BE PRACTICAL FOR SIX MONTHS OR ONE CROP SEASON AT ICRISAT, ICARDA OR U. S. UNIVERSITY SUCH AS ARIZONA.
3. UNIVERSITY OF ARIZONA SHOULD DETERMINE DATES AND LOCATIONS OF TRAINING COURSES, LANGUAGE REQUIREMENTS, COSTS, AND REQUIRED QUALIFICATIONS. REQUEST AID/W CONTACT ARIZONA AND ADVISE MISSION OF AVAILABLE TRAINING COURSES.
4. CANDIDATES WILL THEN BE NOMINATED BY MOA WITH AID PROVIDING FUNDING THROUGH PIO/P FROM PROJECT 040. REFTEL REQUESTING AMENDMENT OF PROJECT 030 AUTHORIZATION DID NOT INCLUDE FUNDS FOR TRAINING. THEREFORE, PARTICIPANTS WILL BE FUNDED THROUGH A PIO/P FROM PROJECT 040 TO AVOID FURTHER AMENDMENT OF PROJECT 030.
5. SINCE ENGLISH CAPABILITY MAY BE A PROBLEM, SUGGEST UNIVERSITY OF ARIZONA GIVE CAREFUL CONSIDERATION TO LOCATING ACCEPTABLE TRAINING COURSES IN ARABIC.
LANE



Attachment six

UNCLASSIFIED

Yemen Training Proposal

Purpose: The purpose of this proposal is to explain how Yemen Arab Government selected trainees could receive six months of agriculture training in the United States at the University of Arizona (U of A).

Background: The Agency for International Development (AID) requested the University of Arizona investigate possible sources of training, to include availability of Arabic speaking schools in the Middle East. Various educational institutions were contacted in the Middle East area to determine applicable course contents and availability. Specific training tailored to the needs of the Yemen attendees was not located in this search. The University of Arizona therefore investigated its own capability and this proposal outlines the training which could be provided with AID's approval.

Training Concepts:

1. Trainees would be selected by the Government of Yemen and approved by the Agency for International Development. Persons attending would possess a high school level education, or equivalent, as determined by the Yemen government.
2. Arabic would be spoken approximately seventy-five percent of the time. Only a limited amount of English would be utilized during instruction. It is estimated twenty-five percent would be required to familiarize the student with applicable terms. English training would be suited to the need of the student.
3. Training would center on how we could help attendees within the constraints of the Yemen environment. We feel it is important that the training not be "Americanized" to the point that they could not utilize it upon their return. The distinctions between laborers, supervisors, managers and administrators would be emphasized. Research principles would be also taught for later use as their country develops research capability. These distinctions would show trainees their place in the chain of agriculture management and also provide them with knowledge concerning their future aspirations.
4. The practical side of agriculture would be taught to allow the students to incorporate this knowledge into their particular level of expertise. Instructors would be utilized who can speak both Arabic and English to assist in course development and presentation. Daily course hand outs would be utilized as a means of weekly review for relevance to the environment of Yemen and also to provide a complete file of material for their future use. U of A faculty who have been to Yemen would be used to assist in course development and actual instruction, where possible.

Course Material: Examples are as follows:

1. Simple terms in English needed to familiarize students with applicable Agricultural uses.
2. Practical side of agriculture.
3. Tools required for on farm use.
4. How to drive a tractor. Actual driving would be provided.
5. Soil preparation.

6. Plant propagation.
7. Irrigation.
8. Tree crops, to include grafting.
9. Root stocks.
10. Sorghum.
11. Alfalfa.
12. Pest control.
13. Weed control.
14. Fertilization.
15. Extension.
16. Research principles.
17. Research stations.

Training Facilities: The University of Arizona campus, local University farms and off campus research stations would be used. Research stations available for use include: Mesa, Marana, Yuma, Phoenix and Safford.

Housing: An attempt would be made to house the students in apartments near the University Campbell Avenue Farm. AID would provide the normal participant allowance of approximately \$500 per month. This allowance would cover living expenses, to include housing. Dependent housing would not be authorized.

Cost: The following cost estimate is provided based on ten students for the first class.

1. Campus man months (36)		
a. Faculty preparation (9)	=	27,000
b. Arabic program manager (12)		36,000
c. Administrator (3)		9,000
d. Secretary (6)		7,200
Man month total		<u>79,200</u>
2. Campus field trip transportation		3,000
3. Round trip air fare \$2,500 x 10		25,000
4. Living expense, \$500/month x 6 x 10		30,000
5. Contingency		<u>10,000</u>
	Total	\$147,200

Name W. Gerald Matlock Affiliation University of Arizona
 Title Director, Int'l Agric. Programs Project UA/Yemen/Sorghum & Millet
 Date Report Submitted March 3, 1981 Dates of trip (inclusive) Dec. 15-24, 1980
 Major places visited Yemen
 Purpose of trip determine future of UA in Yemen AID program

Itinerary:

Date (day/mo/yr)	Place	Contacts	Major Activities
15 December			
0305	Tucson		Departed
1030	New York		Arrived
16 December			
1945	New York		Departed
17 December			
0615	Sanna		Arrived, met by Harnek Sandhu
0745			To CID Guest House
0900		USAID Peterson, Sandhu, Upchurch, Matlock, Sharaf Al-Din arrived later	<ul style="list-style-type: none"> - need travel approval (outside Sanaa) - arrange meeting with Ward for later this morning (12 noon) - Minister in Damascus. SA-D will try to set up meeting on Sat./Sun. - Hammersley, Ronald - comptroller - Have we signed Amendment #8 for \$10K? - per diem paid in local currency \$69 + cost of lodging, Al Jeruba \$34 + cost of lodging - need exit visas - security problem in country
1200		Peterson, Sandhu, Upchurch, Matlock	Project 030 - problems <ol style="list-style-type: none"> 1. YARG won't accept follow up activity in sorghum research. pp thinks it's a mistake, as do other technical people 2. Need institutional tie with UA through CID contract 3. YARG will recognize need in 2 years' time

Attachment seven

Date (day/mo/yr)	Place	Contacts	Major Activities
17 December 1200 (cont)	Sanaa	same	<ol style="list-style-type: none"> 4. Do variety trials, demonstrations on new farm using UA people under core activity 5. Move into formal activities later 6. Use CRSP as a means of maintaining linkages 7. Don't want to lose what we have learned 8. Work it out W/CID to maintain low key presence (a person) generalist 9. Not presented to Minister - go around him 10. Wants to finish Al Jeruba station - wants Markarian to finish it 11. Wants H. Sandhu to complete his work 12. Finish in as good a style as possible - fund report preparation period (for up to 2 months) 13. Need for time to do a good reporting job 14. "Everyone's" feelings have been "ruffled" 15. RPU says posture will be different 16. How much deviation from "good" toward "no-good" before all value is lost? 17. Positive re-adjustment needed 18. Crops component of overall program 19. Get Ministry of Agriculture to identify \pm 30 ha for demonstration, training, etc. - plan for development

Date (day/mo/yr)	Place	Contacts	Major Activities
17 December 1200	Sanaa	Same	<p>20. Start before we know all the answers - use core to initiate, move toward sub-project, recruit for core accordingly</p> <p>21. Level of funding problem + (went to Egypt Air, photo studio, and CID office. Met Linda McCluskey discussed financial records, left passports for exit visas)</p> <p>Meeting with Ward, Johnson, McCluskey and others from previous meeting UA position on involvement, they claim budget constraints and government opposition but want our involvement.</p>
1500		Art & Hazel Jensen	<p>To CID Guest House</p> <p>Lunch and preparation of alternative budgets \$1 m and \$500K ±, dinner with Art and Hazel Jensen, discussed training program for IBB school teachers</p>
18 December 0800		Sandhu	<p>With Sandhu to CID office, telephone call to Tucson, re: Bernhardt and other matters</p>
0900		RPU, Sandhu	<p>To Yemen Air for RPU flight confirmation</p>
0930	Sanna & vicinity	RPU, Sandhu, WGM	<p>Sightseeing - First, to Sandhu's plots on farm in Sanaa, clearly the last year for this farm, to Wadi-Dar, German farm at Amarah. Obvious differences in management of terraces - some neat as a pin, others falling apart. Many opportunities for input - water harvesting possible, much well drilling going on. German farm houses, compound an impressive site without knowing whether any</p>

Date (day/mo/yr)	Place	Contacts	Major Activities
18 December (continued)	Sanaa and vicinity	RPU, Sandhu, WGM	<p>relevant research is being carried out. Reckless traffic on road, many military check points but we weren't bothered. Stopped once by local (civilian) guards - no hassle - many goats on barren range land - hard to see what they eat, but their conditions was good. Some wheat being grown. Saw several large tractors, one man plowing with oxen.</p> <p>Return to Sanaa at 1300.</p>
19 December R&R		Ron Hammersley, et al	<p>Went to Ron Hammersley's open house 2-4 PM. Received a telex re: Bernhardt. Pat Peterson counsels patience (up to 2 years) Says Gates upset about USAID contacting Bernhardt - no details. Told him we were ready to discuss 4 alternatives for UA involvement.</p>
20 December Saturday	Sanaa	RPU, WGM, Pat Peterson	<p>Peterson has asked CID to use Bernhardt as water resources team leader. He wants Bernhardt to write letter to Ministry indicating it was his decision not to return to Yemen at this time. Mission put pressure on CID to keep Arfa, but no pressure re: Bernhardt. Pat Peterson has less discretionary power under Title XII.</p> <ul style="list-style-type: none"> - how CID program organized - wants something to happen - still in state of flux - water is the glue holding activities together <p>YARG wants to rebuild Marib dam, small barrier dam, Sanaa Research Station, 100,000 citrus trees Al Jeruba station</p> <p>Project 030 to continue infrastructure development, well, roof on house, machinery shed and spare parts, wire at Al Jeruba</p>

Date (day/mo/yr)	Place	Contacts	Major Activities
20 December (cont) 1400 2000	Sanaa		<p>Deran Markarian says he can complete - PP will give us memo re: use of convalescent time for consulting</p> <p>We agreed to recruit for "ideal" type for follow-on activities. Discussed training program. He was very enthused.</p> <p>Return to CID Guest House</p> <p>Christmas party at DCN's house, caroling, etc.</p> <p>Talked to C. Ward, P. Peterson had briefed him thoroughly on our discussions. He also was most impressed by training proposal.</p>
21 December Sunday 0900		RPU, WGM, Peterson, Sharif Al Din	Discussed training program - SA-D seemed very interested. Evaluation of students for additional training. Must be done under 052 project, demonstration in cooperation with National Sorghum project.
1000	Sanaa	Min. Hamdani, RPU, Sandhu, Peterson	Went to Ministry of Agriculture for meeting with Minister, waited till 1100. He liked training program but emphasized teaching people to work. He didn't like idea of "demonstrations"; he wants production. Agreed to let SA-D go to CID meetings if he has a plan for next year completed. Hugh Henderson and he (SA-D) will work on that when Hugh returns (about January 15?) Minister Hamdani is most interesting and difficult man. His views are stated positively and are non-debatable. He knows exactly what he wants.

Date (day/mo/yr)	Place	Contacts	Major Activities
21 December continued			Poultry houses and 2000 birds will be given to selected farmers. Without much of anything else this is supposed to result in decreased egg imports. No feed, no vaccines, no markets.
1200		Mohamed Said	Brief visit: Also met new head of planning section.
1230			Went to new state agriculture office building looking for Yaya Shuga - not in
1500		Ambassador Lane, RPU, Peterson	Meeting with Ambassador Lane. He seemed truly interested in what we're doing, but couldn't offer many helpful suggestions. RPU gave him a good briefing on what we've been doing on S&M project.
21 December 1600	Sanaa	RPU, Sandhu	Returned to CID Guest House. Discussed some alternatives <ol style="list-style-type: none"> 1. walk away 2. release more seed for experimental varieties to farmers 3. give collection to FAO/UNDP project at Taiz. <p>Our role less clear at this point. Discussed Sandhu's future with project and UA with him. He understands the difficulties of the situation.</p>
1830		Sandhu, Hammersley	Dinner at Sheba Hotel Changed FFr to YR at 1 to .85 - should be about 1:1.05.
22 December Monday 0800		Linda McCauskey, Sandhu, RPU	The CID office, authorized payment of Sandhu's R&R fare, got statement of deposits, still a lot of

Date (day/mo/yr)	Place	Contacts	Major Activities
22 December continued			<p>confusion. To Egypt Air, confirmed travel, to Yemenia for RPU, Athens closed, he's having to rearrange.</p>
1000	Sanaa	Harry Johnson, C. Ward, Don Merkley, Hammersley	<p>To USAID, turned in travel vouchers to Hammersley, met with Johnson and Ward for debriefing. They okayed Yaya Shuga travel, in principal. P. Peterson to request via Minister of Agriculture, parted in good spirits, to S&M building, met and talked with Don Merkley re: 024 project slated to end 30 September 1981.</p> <p>Mayberry wants 5 more years. Merkley not very optimistic or enthusiastic. Harnek showed us the facilities storage, equipment for S&M. Resolved to discuss with all concerned.</p>
1300			<p>To CID Guest House, had Ethiopian lunch, and work on report. RPU spent most of afternoon and evening resolving travel problem.</p>
1945			<p>Left for airport.</p> <p>Drafted letter for Pat Peterson to send to Minister re: Shuga and letter to P. Peterson re: 030 extension, space requirements and Shuga visit (also told him the Minister had discussed land for demonstration and training farm with Shuga and wanted action on site selection.)</p>
23 December			<p>Departed</p>
0100	Sanaa		<p>Arrived</p>
0320	Cairo		<p>Slight baggage and ticket hassle - advance boarding passes don't work here but TWA in general very helpful.</p>

Date (day/mo/yr)	Place	Contacts	Major Activities
1800 24 December	New York		Arrived
0945	New York		Departed
1445	Tucson		Arrived

Report

(Brief description of how purpose of trip was accomplished or not accomplished.)

Notes on meetings and observations with sufficient information so that they can be of use to other team members, giving dates and names where useful.)

Suggestions for those making future trips to same places, people.

Discussions with USAID officials were very positive in tone. They would like to see University of Arizona continue to be involved in Yemen agricultural development program. The major problem to any continuation of S&M project is the Minister of Agriculture. He sees absolutely no need for additional research or demonstration. Pat Peterson feels that he will change his mind over the next few months. I doubt that the change will be that rapid. Furthermore, judging by past experience, he may not be minister more than a year. We agreed on a "plan" for the next few months - a transition period. It was unfortunate that no CID representatives were in Yemen to participate in the discussions. We still don't have their point of view.

We had substantive discussions with Sandhu regarding his future with University of Arizona. We agreed to look for other opportunities for him should the Yemen project collapse.

Final report for S&M project needs to be well done. R. P. Upchurch started drafting a rebuttal to the USAID evaluation report. I worked on documentation of accomplishments and comparison with objectives listed in contract.

Appendix

This appendix covers the period from March 16, 1981 through May 31, 1981.

University of Arizona project personnel in Yemen made departure plans, turned over project equipment and activities to respective Agency for International Development Mission personnel and returned to the United States. Dr. Markarian departed April 7, 1981. Dr. Sandhu departed April 29, 1981. Mr. James Lenhart, Jr. and Mr. Wallace Swanson departed April 7, and April 8, 1981. Dr. Markarian, Dr. Sandhu and Mr. Lenhart returned to the University of Arizona campus to assist in the preparation of required reports. These individuals hand carried their notes and field data necessary for completion of these requirements.

The following reports were written during this period:

1. Bi-weekly reports for the period December 1, 1980 through May 1 1981. Reports for March 16 - May 1, 1981 are included in this appendix.
2. Mr. Wally Swanson submitted his Yemen trip report. It is included in this appendix.
3. Mr. James Lenhart, Jr. submitted his Yemen trip report. It is included in this appendix.
4. Data was obtained for the Eighth Semi-Annual Report which was finalized and distributed.
5. The final report was written.
6. Annual reports for the years of 1979 and 1980 were completed.

Note: The above reports required extensive coordination among the personnel employed on the contract at the campus level. Many personnel assisted in the preparation of required data who were not on the Yemen contract payroll.

The harvesting and threshing of the Yemen Collection sorghum seed heads which had been returned from the 1980/1981 grow-out in Puerto Rico was completed. Weighing and tabulating of this seed is still in progress. The seed is temporarily stored at the University of Arizona Campbell Avenue Farm seed storage facility awaiting transfer to the U.S. Plant Introduction office in Washington, D.C.

Contract No. AID/NE-C-1304 Yemen
Activity Report No. S-27, March 16 - 31, 1981

3/16/81 Calculated and reranked Damar outreach test.
3/17/81 Inventoried rooms number 5 and 7.
3/18/81 Inventoried rooms number 9 and 13.
3/19-20/81 Weekend
3/21/81 Inventoried rooms number 8, 10 and 11.
3/22/81 Left Sana'a for Hodeidah.
3/23/81 -
3/31/81 Worked at Al Jarubah development site. Visited National Security Office twice a day to procure the passport.

Harnek S. Sandhu

Contract No. AID/NE-C-1304 Yemen
Activity Report No. S-28, April 1 - May 1, 1981

- 4/1/81 Left Hodeidah and reached Sana'a. Meeting with Mission Director and Chief of Agriculture Division at AID. Meeting with Deputy Chief of Mission (DCM) in American Embassy at Sana'a. Chief of Agriculture Division, Dr. Peterson, explained the passport problem to DCM.
- 4/2-3/81 Weekend
- 4/4/81 Prepared the 1980 field record for hand carry to Arizona.
- 4/5/81 Moved the seed stored in barrels and metal containers from the seed lab to a room next to a office to make more room for CID storage.
- 4/6/81 Discussed with AID Project Manager, Mr. Hammer, the seed situation and showed him how and where it was stored for the 1981 planting.
- 4/7/81 Worked on seed samples to be shipped to Arizona.
- 4/8/81 Worked on seed samples to be shipped to Arizona.
- 4/9-10/81 Weekend
- 4/11/81 -
5/1/81 Made arrangements for departure from Yemen Arab Republic to city of origin in the United States. Worked on packing household effects for shipment back to the United States. During this time, Yemen government authorities lost my passport. Spent most of the time to trace it. Received my passport back on 4/25/81. Next couple of days were spent to get an exit visa and shipping seed samples which were made ready on 4/6-7/81. Made plane reservations and left Yemen on April 29, 1981. I reached Washington on April 30th., and my city of origin, Brookings, S.D. on May 1, 1981.

Harnek S. Sandhu

TRIP REPORT

YEMEN ARAB REPUBLIC

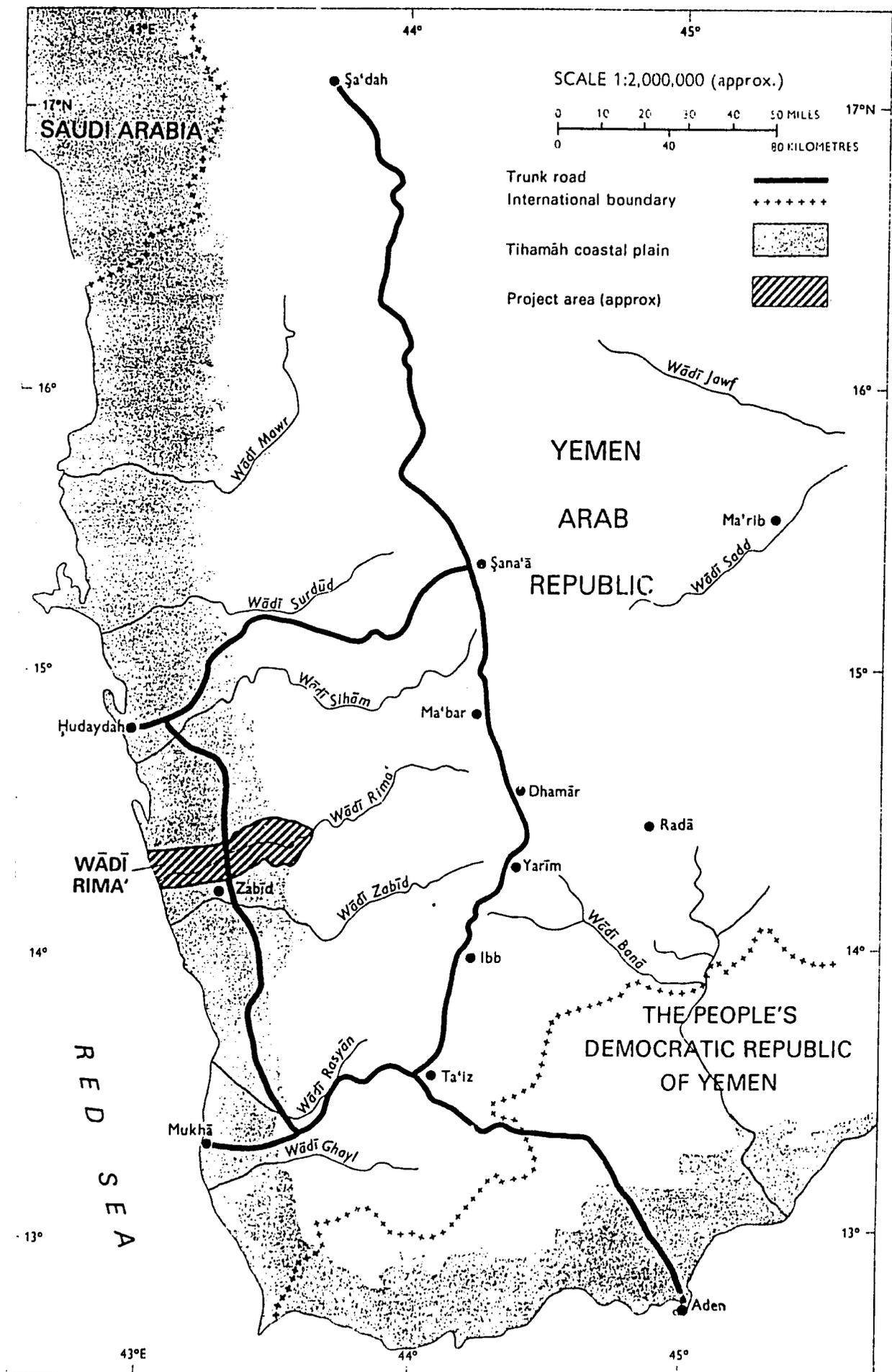
by

W. A. Swanson

Contract No. AID/NE-C-1304 Yemen

National Sorghum and Millet Crop Improvement
Project No. 279-11-110-030

Period Covered: January 27, 1981 through April 8, 1981



TEXT MAP 1 Location of project area

TABLE OF CONTENT

- 1.1 Background
- 1.2 Objectives
- 1.3 Location
- 2.1 Summary
- 2.2 Observations
- 3.1 Work Log

1.1 Background

In early January of 1981 discussions were held between Dr. D. Markarian, Dr. R. L. Voigt of the University of Arizona, and Wallace A. Swanson. The discussions pertained to a short term position in Yemen Arab Republic. The proposed consultancy was to fill the position of an Arizona staff member who was unable to take the commitment. The position was to assist the University of Arizona in the completion of a AID/W Agricultural Development Project for the improvement of sorghum and millet cereal grains.

This report covers Wallace A. Swanson's visit.

1.2 Objective

The objective of the consultancy was to assist the Chief-of-Party, Dr. Markarian, to complete development of an experimental station in the Tihama Region of the Yemen Arab Republic at the Al Jarubah farm.

1.3 Location

The Project site at the Al Jarubah farm is located approximately 50 miles southeast of Hodeida off the Hodeida-Taiz road at 14°20' N latitude and 43°25' E longitude. The Al Jarubah farm is part of the Wade Rima irrigation perimeter, a perimeter that covers approximately 640 Km².

The predominant characteristics of the area are similar to other pre-desert regions plagued by an overuse of natural vegetation. Of the vegetation remaining, the Acacia Nilotica and the Ziziphus Spina Christi are the predominant varieties, with sparse covering of the landscape.

The climate is hot and dry, with an erratic rainy season. The mean annual precipitation is estimated at 300 mm/yr. Temperatures range from 40°C to a low that never falls below 14°C.

2.1 Summary

In general terms, the position for which the author was contracted to work was in supervision, training of labor and the logistics of materials procurement. The aforementioned tasks became my responsibility since I was proficient in the Arab Language (Yemeni Dialect) and had a knowledge of materials availability, price, purchase procedure, plus locations of supplies.

Although the author had only limited contact with project 030 prior to this contract, it would seem that the development of an experimental station at the Al Jarubah farm was fraught with problems from its inception, some five years ago. Upon arrival of the University of Arizona team, these problems were brought home quite vividly during the many meetings held during the first week at Sana'a. It would seem that during the period of time when the project's Chief-of-Party was in the United States for medical reasons, a confrontation or power

struggle inadvertantly or advertantly developed between the University of Arizona's Yemeni Construction Supervisor and the Ministry of Agriculture's Extension Agent/Tax Collector. It culminated in one respect with the intervention by the Director of the Hodeida Provincial Office of the Ministry of Agriculture threatening to order the arrest of the construction supervisor. Coupling this with the Ministry's decision to discontinue the project, created an atmosphere that was less than conducive to constructive development.

Taking into consideration these facts, a work plan was roughly outlined to bring the development of Al Jarubah Station to a stage of completion. The schedule that was finally outlined called for the completion of the Russian duplex residence, and if time allowed, the construction of an equipment shed.

Arriving at the station the facilities were found to be derelict. To illustrate the state of conditioning at the station, the following is a list of repairs or repurchases that had to be made prior to, and along with the starting-up process of bringing closure to the station development:

1. an inoperative generator
2. an inoperative welder
3. 3 empty butane gas cylinders making the stove, refrigerator and cutting torch inoperative
4. only a half a barrel of diesel out of five barrels
5. an inoperative project tractor
6. flat tires on the utility wagon scraper and one wheel barrow
7. two empty gasoline cans
8. lumber and creosote that had been purchased and hauled to the station had been used for other purposes

Once the station was put back in an operational condition, and a crew hired, construction went fairly smoothly except for slight hindrances. The first was the normal training of unskilled labor. When the training was broken down to the proper technique of using a broom and a shovel, the time allocated for this task more than doubled. This altered estimates of work time and efficiency. Only three Yemeni employees were able to advance beyond any basic level. The second problem was a shortage in the supply of cement. The problem was solved by locating and purchasing cement from five different sources.

In spite of these hindrances by the end of construction, one residence was habitable, the second within one week of completion and a frame had been erected for the equipment shed.

2.2 Observations

In reviewing the situation at Al Jarubah the initial question that arises upon entry into the station is, where are the Yemeni counterpart

staff? The question raises additional questions pertaining to the Ministry of Agriculture interest in the development of the station. When ever these questions were brought up, the answer always came back that the Ministry of Agriculture Representative in the area, was the Agriculture Extension Agent/Tax Collector.

3.1 Work Log

1/27 Arrive Sana'a, Yemen Arab Republic

Short meeting with Mr. H. Henderson

1. Up-date on Project Status
2. Administrative Matters

1/28 Administrative Matters

Meetings with USAID/Y

1. Reacquisition of Al Jarubah Development Funds

1/31 Administrative Matters

- A. Currency Exchange
- B. Procurement of Arabic Language Book for Lenhart

2/1 Administrative Matters

- A. Drivers License - Office open but no one in
- B. Meeting with USAID/Y Agricultural section:

Present: Mr. C. McClusky, Deputy AG Officer
Dr. D. Markarian, U of A Chief-of-Party
Mr. J. Lenhart, U of A Horticulturalist
Mr. W. Swanson, U of A Ag Engineer

Discussed during this meeting was:

1. The status of the Al Jarubah Station Development Project
2. A description of the problem that forcibly ejected (Yahya Abdou) the Yemeni construction foreman employed by the University of Arizona
3. A list of what needed to be completed before the station could be turned over to the Ministry of Agriculture. This list included.
 - a. completion of one duplex residence
 - b. equipment shed constructed
 - c. irrigation pump pulled and brought to Sana'a for servicing
 - d. village pump repaired
 - e. possible look at potential for electrification and plumbing of ex-Iman's house
 - f. leveling and development of fields

The list was then arranged in priority and left to the discretion of the Chief-of-Party.

2/2 Meeting with Ministry of Agriculture

Present: Mr. Mohammed Sheifadin, Director General Ministry of Agriculture
Dr. D. Markarian, University of Arizona Chief-of-Party
Mr. J. Lenhart, University of Arizona Horticulturalist
Mr. W. Swanson, University of Arizona AG Engineer
Mr. Yahya Abdou, University of Arizona Construction Supervisor

Discussed during the meeting was:

1. The problem that developed between the University of Arizona Construction Supervisor, Yahya Abdou, and the Ministry of Agriculture Extension Agent, Mr. Algacim, with the later intervention of the Provincial Director of MOA, Mr. Alizoom.
2. The visit by Mr. Mohammed Sheifadin and Mr. Lee USAID/Y to Al Jarubah. The purpose of the visit to assess the structural soundness of the building being reconditioned.
3. A brief history of the Al Jarubah farm, for the benefit of Mr. Lenhart and Mr. Swanson.

2/3 Administrative Matters

1. Drivers License. All forms completed and appropriate signatures acquired, but the man in charge of the stamp was not in. Return the following day.

2/4 Administrative Matters

1. Drivers License. Upon entering the traffic office I was ushered into the Director's office and served tea while the license was taken and stamped. (Swanson's law pays off).

Trip to Hodeida

2/5 Meeting with Provincial Director for MOA

Present: Mr. Alizoom, Director of the Hodeida Provincial Office of the MOA
Dr. D. Markarian
Mr. J. Lenhart
Mr. W. Swanson

1. The introduction of Mr. Lenhart and Mr. Swanson, introduced as Horticulturalist and AG Engineer countracted as Technicians for Al Jarubah Station, but as the sorghum and millet project was phasing out they were here to assist in the phasing out.
2. An estimate of what would be completed in the final 60 days was explained to Mr. Alizoom, including the building that had been questioned with regards to structural soundness. Mr. Alizoom was asked if he had received a report on the structural soundness of the building in question. A copy of the report was produced and the question was answered.
3. Mr. Alizoom brought up the problem of the Construction Supervisor declaring that if he was to return to Al Jarubah that he would be put in jail. We explained that he would not be returning and the matter was settled.

2/7 Trip to Al Jarubah

Purpose: assessment of work to be completed. Upon arrival the station was found to be derelict. This added to our workload.

The station pump had been hot wired and the trusses that had been placed on the building were done incorrectly.

A list of items to be purchased or repaired was made.

2/8 In Hodeida

The full day was spent purchasing materials, repairing tires and charging batteries.

2/9 Trip to Al Jarubah

Hauled into the station: 1 ton of lumber, charged batteries, nails, bolts and other purchases.

Attempted to start generator without success. Attempted to start welder with success.

Returned to Hodeida to discuss the generator problem with the Caterpillar dealer.

2/10 Trip Al Jarubah

Hauled into the station an additional 3/4 ton of lumber and creosote.

Two workers were hired to paint the lumber and start the clean-up process.

Repair work was started on the generator.

A meeting was held with USAID/Y

Present: Mr. D. Hammer, Assistant AG Office
Dr. D. Markarian
Mr. J. Lenhart
Mr. W. Swanson

The meeting was brief and only discussed the problems encountered in starting up. Mr. Hammer restated that development of the station was to go ahead as originally planned.

2/11 Trip to Sana'a

The purpose of the trip was threefold.

1. To pick up the Al Jarubah Station Development funds check, or be reimbursed for funds expended.

2. To repair a vehicle and pick up additional spare parts for possible emergencies in Hodeida.
 3. To pick up spare parts for the welder.
- 2/13 Trip to Hodeida
- 2/14 Trip to Al Jarubah
- Started setting up trusses. Problems in alignment occurred.
- A third laborer was hired. Two of the three laborers started clean-up, while the third creosoted lumber.
- Worked on generator repair.
- 2/15 Trip to Al Jarubah
- Set-up, and welded trusses
 - Worked on generator repair
 - Laborers completed creosoting of purlin lumber and continued clean-up.
- 2/16 Trip to Al Jarubah
- Completed truss assembly
 - Set-up scaffolding for eave construction
 - Laborers continued clean-up
 - Worked on generator repair
 - Discussion with Caterpillar Dealer on sending a mechanic out.
- 2/17 Trip to Al Jarubah
- Started installation of purlins
 - Caterpillar mechanic brought
 - Laborers continued clean-up
 - The village water pump broke down with the constant onslaught of people needing water. One of the laborers was diverted from his duties and put in charge of distribution.
- 2/18 Trip to Al Jarubah
- Continued installation of purlins
 - Located problem on generator, carbon had plugged the exhaust manifold.
 - One laborer assisted in purlin installation, two laborers creosoted remaining lumber. Welded face plate and support poles to rafters.
- 2/19 In Hodeida
- Purchase cement and other materials

2/21 Trip to Al Jarubah

- Worked on generator repair (first start)
- Cemented footings for supports

In Hodeida

- Purchased tin roofing and lumber
- Discussion with Caterpillar mechanic on the origin of a second problem with the generator.

2/22 Trip to Al Jarubah

- Hauled in a load of tin roofing and lumber
- Started roofing
- Laborers completed clean-up of interior while assisting in roofing.

2/23 Trip to Al Jarubah

- Continued roofing
- Installed bottom purlin on awning

In Hodeida

- Purchased additional cement

2/24 Trip to Al Jarubah

- Cut roofing to length
- Cut and shaped ridgeline caps
- Scraped grounds
- Continued roofing
- Worked on second generator problem

In Hodeida

- Discussed second problem with Caterpillar mechanics.

2/25 Trip To Al Jarubah

- Continued roofing
- Repaired generator (finally in running condition)
- Laborers started cementing in gable ends

2/28 Trip to Al Jarubah

- Complete roof
- Repaired trailer hitch
- Laborer completed cementing one gable end
- Started repairing wall cracks

3/1 Trip to Al Jarubah

- Added balast to tractor tires
- Laborers started cementing in second gable end

- Laborers started cementing in eaves
- Built battery rack for tractor
- Constructed ladders

3/2 Trip to Al Jarubah

- Hauled three loads of sand
- Continued cementing eaves
- Continued cementing gable ends
- Contracted cement finishers

In Hodeida

- Picked up ten windows

3/3 Trip to Al Jarubah

- Framed windows
- Started cement plastering outside walls
- Constructed scaffolding

In Hodeida

- Picked up five windows and one door, unable to locate cement for sale.

3/4 Trip to Al Jarubah

- Located source of cement
- Remodeled doors
- Hauled sand
- Continued cementing in eaves
- Framed windows
- Continued cement plaster of outside walls

3/7 Trip to Al Jarubah

- Hauled sand
- Framed windows
- Continued cementing in eaves
- Continued cement plastering of outside walls

In Hodeida

- Purchased plumbing supplies

3/8 Trip to Al Jarubah

- Continued cement plastering of outside walls
- Started construction of bathroom walls
- Framed windows
- Hauled sand
- Continued cementing eaves
- Constructed scaffolding
- Arranged for the purchase of concrete blocks
- Arranged for the purchase of cement

3/9 Trip to Al Jarubah

- Complete cement plastering of outside walls
- Started construction of ceiling
- Started plumbing bathroom
- Continued construction of second bathroom wall

3/10 Trip to Al Jarubah

- Continued to rough-in plumbing to bathroom and kitchen.
- Continued construction of ceiling
- Started cement plastering inside walls
- General clean-up of interior and windows
- Poured bathroom door frame

3/11 Trip to Al Jarubah

- Continued cement plastering of inside walls
- Started construction of second bathroom wall
- Repaired starter on project vehicle
- Continued construction of ceiling
- Continued construction of second bathroom wall

3/12 Trip to Al Jarubah

- Continued cement plastering of inside walls
- Continued construction of second bathroom wall
- Poured second bathroom door frame
- Hauled sand
- Completed construction of first bathroom
- Installed air vents for septic line
- Graveled drive in front of trailer

In Hodeida

- Purchased cement and other materials

3/13 Trip to Al Jarubah

- Continued plastering of inside walls
- General clean-up of interior
- Continued construction of second wall (work progress hampered due to intense rains).

3/14 Trip to Al Jarubah

- Completed construction of second bathroom
- Continued construction of ceiling
- Continued plastering inside wall
- Set in locking mechanism for faucet and pump

3/15 Trip to Al Jarubah

- Completed ceiling construction
- Fixed trailer door
- Hauled a load of sand from Highway exit to Al Jarubah Station (the action was deemed necessary as the normal course of sand had been flooded two days)
- General clean-up of building
- Continued cement plastering of inside wall

In Hodeida

- Purchased cement and other building materials

3/16 Trip to Al Jarubah

- Hauled sand from Highway
- Continued cement plastering of inside walls

3/21 Trip to Al Jarubah

- Hauled sand
- Started laying in electrical cable
- Started finish plumbing of kitchen
- Continued cement plastering of inside walls

3/22 Trip to Al Jarubah

- Continued cement plastering of inside walls
- Started white washing of interior walls
- Completed finish plumbing in bathroom
- Hauled sand (water became a problem and had to be subsequently mediated by the government representative for the area).

3/23 Trip to Al Jarubah

- Layed out and augered holes for equipment shed
- Poured bathroom floors
- Continued plastering of inside walls
- Continued white washing of interior walls

In Hodeida

- Purchased one wheel barrow and other building materials.

3/24 Trip to Al Jarubah

- Cut pipe to length for shed poles
- Continued white washing of interior walls
- Inventoried equipment
- Manufactured a concrete bit
- Continued cement plastering of interior walls

3/25 Trip to Al Jarubah

- Welded pipe sections to length poles for shed
- Set poles in position and cemented in place
- Continued cement plastering of interior walls
- Pour shower floor
- Continued white washing of interior walls
- Completed plastering interior walls

3/28 Trip to Sana'a

3/28 Meeting with USAID/Y

Present: Mr. P. Peterson, AG Officer
Mr. D. Hammer, Deputy AG Officer
Mr. W. Swanson, U of A AG Engineer

Meeting with US/Embassy Counselor section

Present: Counseling Officer
Mr. D. Hammer, Deputy AG Officer
Mr. W. Swanson, U of A AG Engineer

3/29 Trip to Hodeida

3/30 Trip to Al Jarubah

- Started installation of sink
- Completed white washing of interior walls
- Cleaned windows and doors
- Screened in ceiling vent and generator radiator vent
- Cemented in eaves of generator house

In Hodeida

- Contacted a hauling company and arranged for a moving date.

3/31 Trip to Al Jarubah

- Started white washing exterior walls
- Complete installation of kitchen sink
- Started general clean-up and pack-up

4/1 Trip to Al Jarubah

- Loaded tractor and other nonessential equipment for transport to Sana'a
- White washed generator house
- General clean-up and pack-up

4/2 In Hodeida

- Assisted in packing at the Markarian residence

4/3 Trip to Sana'a

4/4/ In Sana'a

Meeting with USAID/Y

Present: Mr. D. Hammer, Deputy of AG Officer
Mr. D. Hammersly, Administrative Officer
Mr. W. Swanson, U of A Ag Engineer

Discussed during this meeting was a problem of the two month per diem due Mr. Swanson.

Second meeting with USAID/Y

Present: Mr. P. Petersen, AG Officer
Mr. D. Hammer, Deputy AG Officer
Mr. W. Swanson, U of A AG Engineer

Discussed during this meeting was the close-out of the Al Jarubah Station and Dr. Markarian's house.

4/5 In Sana'a

- Assisted Dr. Markarian in closing down the project 030 operation.
- Arranged flight for departure

4/6 In Sana'a

- Write-up time

4/7 In Sana'a

- Write-up time

4/8 Departure from Sana'a

TRIP REPORT

YEMEN ARAB REPUBLIC

by

JAMES H. LENHART, JR.
University of Arizona

Contract No. AID/NE-C-1304 Yemen

National Sorghum and Millet Crop Improvement
Project No. 279-11-110-030

Period Covered: January 13, 1981 through April 7, 1981

5/20/81

TDY Work Report: Yemen Arab Republic (YAR)
James H. Lenhart, Jr.

On January 13, 1981 I arrived in Washington, D.C. The following morning I contacted Mr. Ollie Bracy, AID, State Department. I was issued a letter of introduction which I took to the YAR Embassy where I was issued a visa for three months.

I arrived in Sana'a at 11:00 PM on January 18. I was driven to the Consortium for International Development (CID) guest house where I stayed until I departed for Al Jarubah, Monday the 19th. I was taken to the Agency for International Development (USAID) mission where I was introduced to the staff. I was briefed by Campbell McCluskey as far as the current Al Jarubah situation was concerned.

Until January 28th, Dr. Markarian's arrival, I became oriented to the organizational and activity structure of USAID and CID. I obtained a drivers license and USAID identification. In my spare time I worked for Hugh Henderson in setting up his CID office.

Dr. Markarian arrived with technician Wally Swanson, January 28th. After various CID and USAID meetings, vehicle preparations, visa applications, the University of Arizona team departed for Hodeida on Wednesday, February 4th. Mr. Swanson and I checked into the Al Borg hotel. Dr. Markarian and his wife went to their local residence.

On Thursday, the 5th., we visited Ali Zum, local Ministry of Agriculture official, to discuss our plans for Al Jarubah. It was agreed that we would work only on the Russian building for a period of two months and that no sorghum or millet be planted. It was also agreed that Yahia Abdo would not be associated with the Al Jarubah project.

We departed for Al Jarubah on February 7th. Upon review of the station, it was decided that its condition warranted time for repairs to make it operational. There was an immediate need for spare parts, tools, fuel, batteries and construction material. The generator was totally inoperative, keys and batteries were missing, all fuel tanks were emptied. Some equipment was damaged or missing.

It should be noted that the Tihama climate put a great deal of stress on the vehicles. In the first few days, we had numerous flat tires, broken fan belts, leaking radiators and hoses, broken alternators and air conditioning plus clogged air filters. Obtaining parts was very difficult and time consuming.

We began immediately to purchase supplies; ie, bolts and lumber for roof purlins, creosote for termite prevention and tools for working.

Generator repair was ultimately handled by Dr. Markarian and myself due to the inefficiency of the local Caterpillar dealership.

On February 11, Wally Swanson and I returned to Sana'a to pick up spare parts, project funds, and to return Al Jarubah equipment which was unused and neglected. The 14th was the first day of actual construction. Assembly and installation of the roof trusses was completed on the 15th. All but one of the Yemeni laborers refused to walk the roof line. The installation of the roof purlin was completed February 21st. It was difficult due to bowed and twisted lumber and soft metal bits which operated poorly. We also installed roof edges and eave poles.

Covering the roof was performed by the University of Arizona team. The laborers were unable to use a hammer or operate in a systematic fashion necessary for fast and dependable work. Winds and high heat reflection slowed tin installation. The roof was completed on February 28th. During this time, the generator was repaired. Its basic problem was oil leaking from the turbo charger into the intake system. Excessive carbon deposits blinded the exhaust system making the engine inoperable. Scaffolding for outside cementing was set up and the debris around the area was removed.

On March 1st we began to cement the outside of the building. Large wall cracks were filled and new ladders were constructed. Dr. Markarian designed a modular ceiling system and ceiling supports were welded up. We employed three skilled cement workers in Beta-al-Faig. We had to supply them with large amounts of cement, which at this time was in short supply. We were required to pay black market prices after long searches. We also contracted for a steel working company to construct the doors and windows for the Russian building. The outside of the building was completed with doors and windows installed by February 9th.

The inside of the building was started next. The workers built bathroom walls, repaired holes in the floors, framed the inside doors and windows, and cemented the walls by March 31st. During this time we roughed in the plumbing, installed electricity and completed one bath and kitchen sink. Both the inside and outside of the building were painted. The generator shed was made bat proof and support columns were set for an equipment shed.

On April 1st a truck arrived and we loaded all equipment that was not necessary for the 052 project operation. We locked the buildings and water supply system for a final departure.

We departed for Sana'a on the 4th after cleaning up and locking up tools in Dr. Markarian's house. For the next two days we met with USAID to settle our accounts and to report our project work. On April 7th, Dr. Markarian departed Sana'a and Wally Swanson's and my TYD status was terminated.

After three months in the YAR I decided to seek employment for two more years. It is needless to say I had an enjoyable experience. I felt very productive and involved with the Yemeni people.

It is difficult to understand the situation in Al Jarubah without having spent some time there. The lack of education and skills among the local populace makes training and communication difficult. The basic needs of the people revolve around water. The combination of the above leads to petty water pilfering causing equipment abuse and time loss.

This indicates a strong need for a community development program and intercommunal interaction, which could be developed by building a road to the main highway. I feel it is necessary for a full time technician to be employed at the Al Jarubah station. The technician should understand equipment maintenance, construction, agriculture techniques and be sensitive to the needs of the people.

Commuting between Hodeida and Al Jarubah is tiring and time consuming; however, it was necessary due to the large amount of supplies being brought in. A typical day consisted of departing at 6:00 AM arriving at 7:30 AM. We worked straight through until 2:00 PM and returned to Hodeida at 4:00 PM. Time was then spent, sometimes until 9:00 PM. in acquisition of supplies.

During the stay there, we were hampered by heavy rains which at times prevented entry to and exit from Al Jarubah.

Support from the USAID Mission seemed minimal and sometimes hostile. I feel the reason for this was that the situation was judged by short excursions by USAID officials to Al Jarubah. The work we performed was done with all possible speed and our accomplishment was grossly underrated.

Dr. Deran Markarian is extremely capable in the field. His agricultural expertise is well complimented by his mechanical skills and aptitude for logistical coordination.

Wally Swanson was invaluable due to his excellent command of the language and customs of the people. His knowledge and interest in economics, history, customs and foreign programs is extensive. I would recommend his report be read very carefully and by all concerned. I would also recommend his services at anytime.

I found Yemen a valuable experience which may lead to a enjoyable career. I hope the Al Jarubah station will be a learning experience to us all. I have kept a photographic record of our work and am willing to submit it to the University of Arizona if deemed necessary.

James H. Lenhart, Jr.