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MANAGEMENT REPORT

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Submitted to the Office of the Science Advisor
U.S. Agency for International Development

COORDINATED USE OF MARGINAL WATER RESOURCES IN ARID AND DESERT AREAS , Stage II

Principal Investigators: Dr. Pedro Berliner, Dr. J. E. Ephrath and Dr. S. Barak
Grantee Institution: Jacob Blaustein Institute for Desert Research, Ben-Gurion University of the Negev

Collaborator: Dr. J. Nyabundi, Department of Horticulture, Maseno University College, Faculty of Science,Maseno, Kenya

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1) Scientific Summary

The present research program is a continuation to the AID/CDR Program C11-133. The results obtained during the latter showed that it is the possible, in arid areas, to supplement runoff water with brackish water irrigation in order to *Acacia saligna*, a quick growing leguminous shrub. It was also shown (in pot trials) that fertilization can improve the development of seedlings irrigated with brackish water.

In order to allow the implementation of this technique (irrigation with runoff supplemented with brackish water) further research is required. as detailed in the proposal of Phase II of the project. The specific research objectives as detailed in the approved proposal were:

I. **Fertilization** (pot and field trials)
   a. To test new fertilization techniques with Mo, bicarbonate and nitrogen. To study the effect of selected mycorrhiza, which stimulate nutrient uptake by roots under saline conditions .
   b. To enhance stress tolerance of N_2-fixing symbiotic bacteria in the roots of Acacia by screening for salt tolerant species of N2-fixing microorganisms living in symbiosis with Acacia roots in Israel and Kenya.

I. **Re-growth patterns** (field trials).
   a. Assess the effect felling height above the ground or lopping have on shoot re-growth and root development when irrigated with runoff water only.
   b. Monitor the effects that different levels of soil salinity, and quality and quantity of water application have on the behaviour of *Acacia saligna* shrubs after lopping at 1.5 m. height. We will monitor the following key aspects:
      i. shoot re-growth,
      ii. shrub water relations and biomass production characteristics,
      iii. soil moisture absorption patterns of the shrubs,
      iv. photosynthesis, and
      v. in situ spatial and temporal distribution of roots with the aid of minirhizotron system

I. **Intercropping** (Kenya, field trial) Evaluate the possibility of intercropping between the trees in the aftermath of runoff events. Sorghum, a highly versatile and popular grain crop in Turkana, will be used as an intercrop.

2) Scientific Issues

There are at this stage no scientific issues.

3) Managerial Issues

Israel: Dr. S. Barak replaced Prof. S.H. Lips as Co-P.I.

Kenya

The main problem we face in Kenya is the high mortality of trees (planted during Phase I of this project), due to the lack of manpower (no financial support) needed to carry out maintenance work during the period that lasted between the end of Phase I and the beginning of Phase II. The plots have to be replanted. The first batch of seedlings was prepared at the University of Kisumu and the second batch is being prepared now. All seedlings will be planted in April, at the end of the rainy season. Due to this unexpected change some delays and shifts in the original timetable may occur.

Israel:

Trees will be lopped after the field plots are flooded at the experimental site in Israel (*Wadi Mashash*) The remaining set of experiments planned progress as scheduled.

A request to transfer US$3,000 from "Materials and Supplies" to "Equipment" section was approved. A digitizer for root studies and a fluorometer for the photosynthesis studies was purchased.

Collaboration Travel, Training and Publication

Dr. Jhonathan Ephrath visited Kenya during October 2002 in order to meet the local PI, Prof. J. O. Nyabundi from Maseno University and visit the experimental site in Kakuma.

After the vivit to the experimental site the following decisions were made:

1. Project will be carried out on the same plots on which the first stage of the project was carried out..
2. Brackish water supply will be from local wells and the irrigation will be applied by low pressure drippers (available in Prof. Nyabundi's lab). If problems arise with the conveyance of water from the well to the plots, a tanker will be used to transport the water

3. Intercrop will be planted on the second year, after the establishment of the trees.
4. Four catchments will be planted. One of them will be used as a backup in case of a problem
5. The existing additional catchments will be used as a demonstration plots for domestic varieties of trees.

Prof. Nyabundi will visit Israel for a period of about 2 weeks during late April in order to plan future measurement campaigns at both sites, discuss scientific issues and prepare the first year report.

5) Request for A.I.D. Actions.

At this point we do not have any special requests from the American Embassy in Tel-Aviv or from the AID staff.