TECHNICAL ASSISTANCE AND TRAINING UNDER USAID-ISRAEL COOPERATIVE DEVELOPMENT PROGRAM

Purchase Order #HNE-0185-0-00-5056-00

CONTRACTOR INFORMATION

RODNEY J. FINK, PhD
148 Fawn Ridge
Macomb, IL. 61455
Ph. (309) 833-5192
Fax. (309) 837-1140
INTERNET: RJ-Fink@bgu.edu

Prepared for:

USAID G/HCD/PP
Edward Lijewski
Room 606 E, SA-18
USAID
Washington, D.C. 20523

An assessment of the Appropriateness, Delivery and Support, and Effectiveness of Technical Assistance and Training Provided to Countries of Central Asia and Georgia under the USAID-Israel Cooperative Development Program

(Cooperative Development Program #298-0185)

By:

Rodney J. Fink, Contractor
and
Shimeon Amir, MASHAV, ISRAEL

OCT. 1995

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ACRONYMS

MASHAV	Center for International Cooperation in the Israel Ministry of Foreign Affairs
AGRIDEV	(Agricultural Development), Israeli executing agency of MASHAV for the CDP CAR/Georgia
CINADCO	Center for International Agricultural Development Cooperation of Israel's MOA (coordinates with MASHAV)
CAR	Central Asian Republics
CDP	Joint development program of the Government of the USA (USAID) and the Government of Israel (MASHAV)
MOA	Ministry of Agriculture
USAID	United States Agency for International Development
TICA	Turkish International Cooperation Agency (counterpart of USAID or MASHAV)
FTF	Farmer-to-Farmer Program of USAID
Kibbutz	Collective settlement in Israel
Moshav	Israeli agricultural cooperative villages where each family lives in its own home and works its own plot of land, with varying degrees of cooperation
ha	(Hectare) a tract of land equal to 10,000 M^2 or 2.47 acres
OTS	On-The-Spot Course: Training course offered in host country by Israeli experts
Kolkhoz	Former collective farm of the USSR that has now issued shares to members to form a joint stock company, often called a cooperative farm
Sovkhoz	Government farm of the USSR System
Oblast	Geographical region within a country of the CAR/Georgia, similar to a state in the USA
Rayon	Sub-section of an oblast, similar to a county in the USA
NGO	Non-government organization
TACIS	Water Resources Management and Agricultural Production in the Central Asian Republics (Program of the European Union)
VOCA	Volunteers in Overseas Cooperative Assistance, an implementor of the FTF program in Kazakhstan

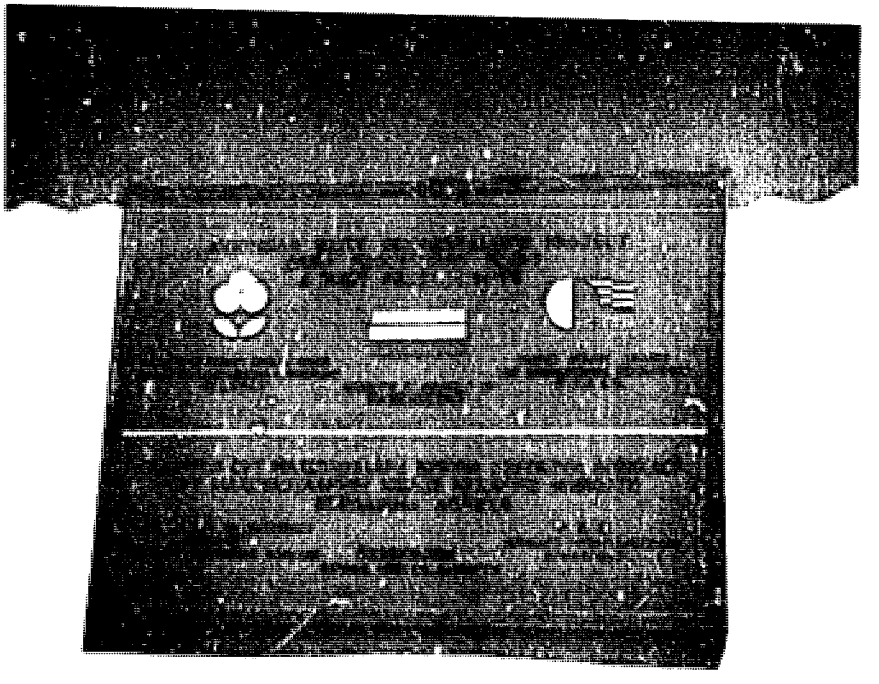
PHOTO SUMMARY

ISRAEL & U. S. COOPERATION IN THE CAR/GEORGIA

Technical Assistance and Training Under USAID-Israel
Cooperative Development Program in the
Central Asian Republics & Georgia

Prepared and Submitted by
Rodney J. Fink & Shimeon Amir

October, 1995

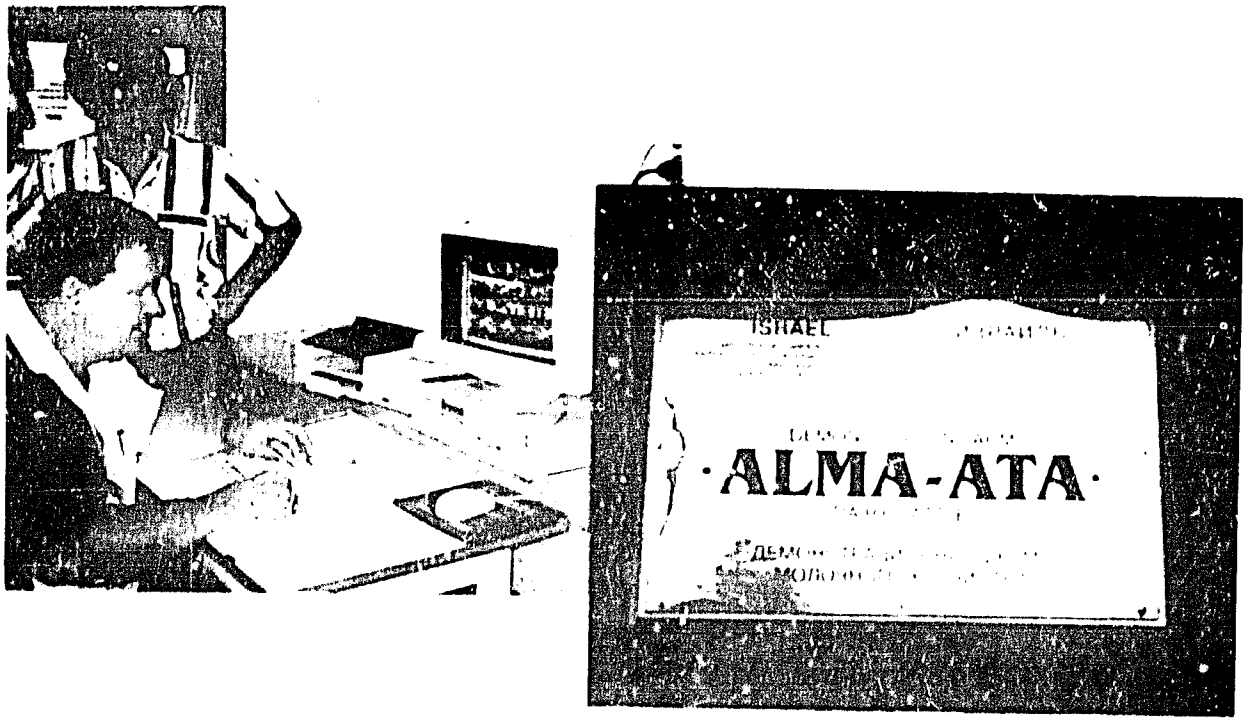


Dairy demonstration project on the Akurgan Farm
in Uzbekistan

COOPERATION BETWEEN ISRAEL, U.S. AND CENTRAL ASIAN REPUBLICS & GEORGIA

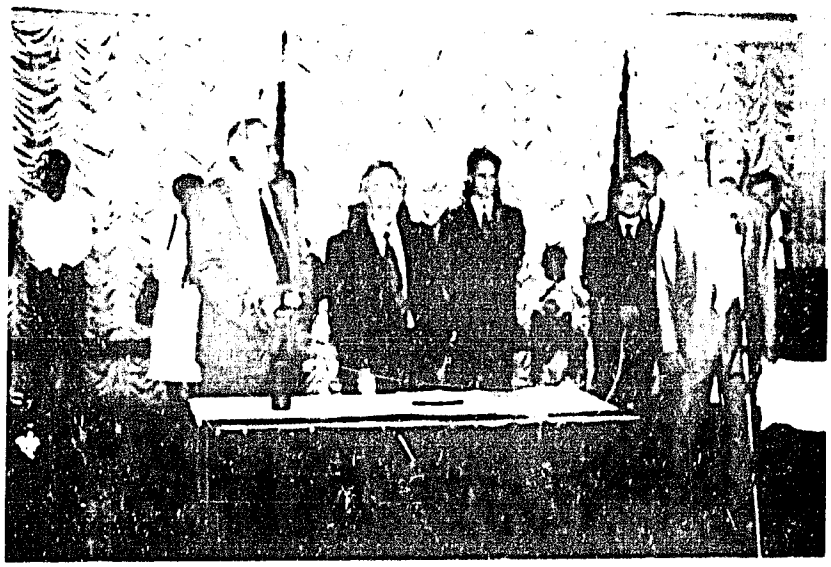
The Cooperative Development Program (CDP) of USAID and MASHAV (Israel) in the Central Asian Republics and Georgia (CAR/Georgia) provides training in Israel and establishes demonstration farms to focus on agricultural development. The CDP CAR/Georgia programming was established in 1992 with $2.0 million USAID funds and $300,000 Israeli funds. The FY 1995 funding of $6.75 million (U.S. $4.5 million and MASHAV $2.25 million) expands CDP activity to a special program for Turkmenistan and Uzbekistan, utilizing resources of Turkey, in addition to the U.S. and Israel. In addition, FY 95 funding will extend CDP activities to Tajikistan.

The changes in the countries of CAR/Georgia which occurred when the USSR dissolved brought about the establishment of diplomatic relations with Israel. The CDP responds to interest in assistance from Israel, especially in the areas of agriculture and rural-based support institutions. Training (in-Israel and in-Country) and technical assistance were linked together to form viable projects in each country.



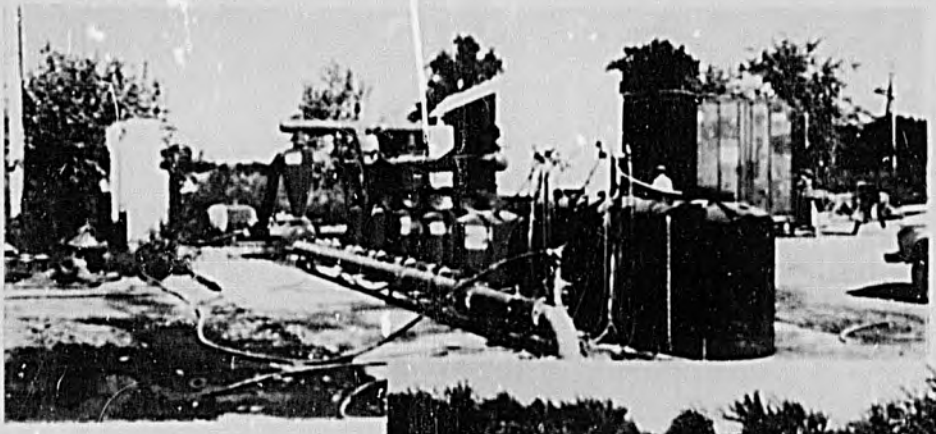
(Left photo) The introduction of computer technology has assisted the Alma Ata farm improve its dairy management through a viable system of maintaining dairy cow records.
(Right photo) Sign over the Alma Ata mini-dairy.

Participants from each country have attended training courses in Israel. CDP courses cover areas such as agricultural development, management, irrigation, and a variety of agriculture production areas. In addition to the CDP courses, MASHAV offers courses in other areas such as health and medicine. Participants from the CAR/Georgia have been well-prepared as most held academic degrees and many had advanced degrees; many held leading positions in their respective countries. To maintain contact with the returned participants, the Embassy organizes "Shalom Clubs" in the countries. The evaluators visited the first meeting of the Shalom Club in Uzbekistan, attended by over 100 participant returnees from Israel.



(Upper photo) The President of the Uzbekistan Shalom Club addressing members at the first meeting of the group. **(Lower photo)** Members attending the first Shalom Club meeting in Uzbekistan.

The Uzbekistan Akhmad Yasawi Farm has been successful in increasing vegetable production while moving toward privatization by having farm families assigned portions of the land as their responsibility. The farm has been expanded to 46 ha, and has been the site of many Field Days and training programs. The Israeli Experts work with both public and private sector groups. The farms selected for demonstration sites are going through the process of privatizing, usually by becoming joint stock companies.



(Upper photo) The use of proper irrigation techniques and equipment has enabled the Akhmad Yasawi Farm to increase production while using less water. **(Center photo)** Individual families have been assigned a portion of land at Akhmad Yasawi as their responsibility. **(Lower photo)** Evaluator meeting with the head of a "Private Farmers' Organization" in Kyrgyzstan.

The Israeli Expert Economist works with the privatizing farms to help farmers understand the process. In addition, the Economist works with other groups, both government and private, to assist with programs meeting project objectives. In the Akurgan Dairy Farm, the mini-dairy is operating quite well. The project is trying an innovative approach to privatization by allowing farmers from the Kolkhoz to buy land and dairy cows and be responsible for production. The central service center of the Kolkhoz will then supply feed and handle marketing. Two farmers are piloting the process, and more will follow when success is determined.

(Upper photo) Israeli Dairy Expert (left) and Economics Expert (right) with two Akurgan farm members who will be the owners of a small dairy herd, complete with milking parlor. **(Center photo)** Construction is underway on the model farm milking parlors on the Akurgan farm. **(Lower photo)** The Israeli Vegetable Expert for the Kunarli farm (left), the Economics Expert for Kyrgyzstan and Kazakhstan (right) with the agronomist on the Kunarli farm (center).

Improvement of dairy herds is a major objective for the CAR/Georgia Program as is marketing products after they are produced. The dairy projects are working on both of these issues. The information generated is being fed back into government circles for informational purposes. The experts work with other donor organizations such as the Farmer-to-Farmer Program and the TACIS Program of the European Union.

(Upper photo) The Israeli Expert (left) at Alma Ata shares products of the mini-dairy with the dairy manager (center) and a representative of the MOA (right) who works with the processing of trainees who go to Israel from Kazakhstan. **(Center photo)** The Israeli Dairy Expert discusses cattle improvement with the Dostuk (Kyrgyzstan) Farm Manager. **(Lower photo)** Modern equipment supplied for the mini-dairies in the three countries.

The experts work together with local organizations (both public and private) to help improve production and facilitate the privatization process. The economist (left), dairy expert (second from left), and crops/irrigation expert (center) meet with the two evaluators (right) at the Dostuk mini-dairy site.

The Israeli Embassies oversee the CDP for MASHAV. In the yearly work plan presented to the Israeli Ministry of Foreign Affairs by CAR Ambassadors, Ambassadors referred to the MASHAV activities (including CDP) as a great asset in helping them reach the level of understanding and friendship they enjoy in the countries of Central Asia. The MASHAV/CDP program is an integral component of the Israeli foreign program which has helped Israel develop good relations in countries throughout the world.

The Foreign Minister of Israel, Shimeon Peres (center), with Israeli Ambassador to Kazakhstan Carmel (left) and Kazakhstan Foreign Minister Tokayev (second from left) with the evaluation team of Shimeon Amir (second from right) and Rodney J. Fink (right).

THE PROJECT

USAID-ISRAEL Cooperative Development Program for the Central Asian Republics & Georgia

Project Number: 298-0185

Project Description: The CDP for the CAR and Georgia establishes demonstration farms to focus on both agricultural and technological elements, including social and economic issues such as marketing systems, cooperatives, and associations of independent farmers. Training and support is provided in management and other areas by courses provided in Israel and by in-country courses by Israeli experts. A separate program, beginning in late 1995, provides quadrilateral cooperation between the host countries of Turkmenistan and Uzbekistan, USAID, MASHAV and Turkey. Turkey will contribute expertise in field agriculture, surface furrow irrigation, grain crops, and agriculture economics.

Project Purpose: To provide technical assistance utilizing Israel's expertise and experience in the use of modern technologies and applied science for development. Modern technologies will be demonstrated and supported to facilitate the development of the free market system for rural enterprises. The CDP CAR/Georgia addresses development needs, while expanding relations between Israel and the host countries.

USAID Inputs: Financial commitment from 1992 through 1995 of $11 million by USAID includes a FY 95 commitment of $4,500,000 ($3 million for on-going CAR/Georgia Program and $1.5 million for the Quadrilateral Program component). Financial commitments of MASHAV from 1992 through 1995 of $4,416,000 includes a FY 95 commitment of $2.25 million ($1.5 million for the CAR/Georgia Program and $.75 million for the Quadrilateral Program component).

Project Outputs: Demonstrated utilization of modern technological inputs for agriculture; improved private farmer organizational ability; provided training and management support to farmers of various systems and agribusinesses; promoted microenterprise development; and improved irrigation and water resources management.

CDP CAR/Georgia FY 1995 Funding: $6.75 million (U.S. portion of $4.5 million and an Israeli portion of $2.25 million)

FY 1995 Objectives: To provide a blended package of short-term consultancies; training in-Israel and in-Country; procurement of machinery/equipment, combined with already in-place Israeli long-term experts at existing demonstration farms; and more specifically, to: a) support development of agribusinesses by strengthening leading farmer organizations and family, farm-based, dairy farms; b) establish additional demonstration farm

units and expand existing ones in cooperation with agricultural universities and other training institutions.

Required Reports: Annual report and development of a joint annual work plan.

Previous Evaluation: A joint USAID-MASHAV evaluation of CDP world-wide activities (excluding CAR/Georgia) was completed in January 1994.

Project Implementor: The project is implemented by MASHAV within the guidelines of the jointly developed "Annual Work Plan." The implementor in developing countries is the Israeli Embassy in that country. The Israeli Ambassador provides liaison with the USAID Mission as appropriate.

EXECUTIVE SUMMARY

THE PROJECT

The Cooperative Development Project is useful and relevant for the receiving country and, at the same time, strengthens Israel's linkages and relationships with the CAR/Georgia by providing Israeli experience and expertise in the use of modern technologies and applied science, research, and management for development in selected areas. The program addresses important development needs while expanding relations between Israel and the host countries. The CDP/MASHAV Program for CAR and Georgia provides training and establishes demonstration farms to focus on both agricultural and technological elements, including social and economic issues such as marketing systems, management, cooperatives, and other forms of associations of independent farmers.

Training and support is provided in management and production agriculture areas by courses provided in-Israel and in-country courses by Israeli experts. Modern technology is being demonstrated and supported to facilitate the development of the free market system for rural enterprises. A separate program, not yet actively operating, will provide cooperation between the host countries of Turkmenistan and Uzbekistan with Turkey, USAID, and MASHAV (Quadrilateral Program).

The program is administered by MASHAV (Center for International Cooperation in the Israel Ministry of Foreign Affairs) with professional cooperation of CINADCO and AGRIDEV serving as an implementing agency. In host countries, the program operates through the Israeli Embassy in the country served. The FY 1995 funding by the U.S. is $4.5 million (CDP/Georgia @ $3.0 million and the Quadrilateral Program @ $1.5 million). Israel provides matching funding of $2.25 million (CDP/Georgia @ $1.5 million and the Quadrilateral Program @ $.75 million).

THE EVALUATION SCOPE

The scope of work calls for a team (consisting of a U.S. consultant and a MASHAV representative) to assess overall project performance, make recommendations for mid-course adjustments, if necessary, and recommend future courses of action. The report was to assess and evaluate the rationale of the project and assess the contributions of the program to development in CAR/Georgia. Detailed assessment was to be provided on specific components of training, short-term consultancies, and long-term consultancies.

THE METHODOLOGY

The team carried out a review of program documents prior to

leaving for Central Asia. The contractor interviewed representatives of USAID and joined the Israeli member to carry out interviews of MASHAV/CINADCO/AGRIDEV personnel in Israel. Six demonstration farms were visited, two each in Kazakhstan, Uzbekistan, and Kyrgyzstan. Graduates of courses in Israel (and on-the-spot courses) were interviewed for their opinion of the training and its relevance to their country situation. USAID Mission staff were interviewed, as were government officials of the Ministry of Agriculture, members of farms, and leaders of private farmer organizations. Linkages between MASHAV and NGOs were reviewed for their appropriateness.

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

Project objectives are being met through a combined program of training and technical assistance. The training components, both in-Israel and in-Country, are enthusiastically received by participant recipients. The long-term Experts are networking effectively with government and non-government organizations working in the countries. The project is meeting some USAID Mission goals related to privatization and meets MASHAV and host country goals. The project is important to the Embassies of Israel in the countries visited and adds to their stature with the host governments. Israeli Embassies, in executing the program, give proper and generous credit to the role of USAID.

MASHAV/CDP presence in the CAR/Georgia is well-known by other governments and NGOs. The experts are hard workers, well-liked, share information freely, and have an overall good reputation in both the expatriate community and in the host country. Many linkages exist, including productive linkages with VOCA, WINROCK International, and the TACIS (European Union) program.

Section III provides a discussion of the components of the program with specific conclusions and recommendations for each component evaluated. General conclusions and recommendations follow:

1. Continuation of the CDP CAR/Georgia

Conclusions: The program is meeting development needs of the host country and provides a useful opportunity for the Israeli Embassies to carry out a successful development program. Training in Israel is well received and helps inform participants of development progress made in recent years. The stature of the Israeli Embassy is enhanced by outputs of the program.

Recommendations: The CDP CAR/Georgia program is meeting the assigned objectives in these countries and should be continued.

Action Responsibility: USAID Washington and MASHAV

2. Content of In-Israel Training Courses

Conclusions: Participants interviewed were pleased with the courses but suggested that courses include more training in economics, management, marketing, and entrepreneurship. Inclusion of some on-the-job training was suggested for some participants. The program is reaching the desired audience of trainees Effective course follow-up is in place by MASHAV for the program.

Recommendations: Increase emphasis in economics, management, marketing, and entrepreneurship. This can be accomplished by a slight increase in these course offerings but primarily by integrating more of these topics into the agricultural production courses. Whenever possible and appropriate, consider offering a "shadowing experience," in which a participant spends a few days following a private sector farmer or agribusiness person. Spending a week in a Moshav or Kibbutz is another good alternative.

Action Responsibility: MASHAV, CINADCO, AGRIDEV, and training providers.

3. Demonstration Farm Activities:

Conclusions: Two farms are on schedule; two are behind schedule but making progress; one has not been initiated; and one has made little progress to date. Operations which have a rapid economic return (such as the mini-dairies) have been readily accepted. Computers are being used effectively on at least two herds to maintain dairy records for herd improvement purposes. Possible mid-term program adjustment is in order for the Alga and Kunarli Farms. Operations where the expert works with the local counterpart have performed best.

Recommendations: Work on the farms which are behind schedule should be facilitated to meet program objectives. On demonstration farms where a suitable, working counterpart has not been identified, a counterpart should be quickly identified and trained.

Summary recommendations for each demonstration farm follow:

A. Alma Ata Dairy Farm, Kazakhstan: Continue to work with the counterparts and complete the milking parlor. Continue development of marketing plan for mini-dairy (with help of Winrock FTF Volunteer).

B. Akhmad Yasawi Farm, Uzbekistan: Identify a counterpart immediately for training to take on role of the Israeli Expert. Develop plan for follow-on activities.

C. Akurgan Farm, Uzbekistan: Facilitate the market development process for the mini-dairy and completion

of the model dairy farms and feed center. Work with MOA, Ministry of Health, and Embassy to obtain a license for marketing in Tashkent.

D. Dostuk Farm, Kyrgyzstan: Facilitate the installation of the mini-dairy equipment and the milking parlor. Emphasize market development of mini-dairy output.

E. Alga Farm, Kyrgyzstan: Reconsider the desirability of remaining on the site. If work continues in 1996 with Korean farmers, diversify activities of the Expert by adopting other on-farm demonstration sites and emphasizing extension activities.

F. Kunarli Farm, Kazakhstan: Since work has not commenced, consider abandoning this farm site because of the demands of the Farm Chairman (the original Chairman died, and reportedly the current Chairman has now agreed to the original terms w 'h MASHAV). Consider, along with this location, other options (such as ChymKent) where conditions are more arid. A second alternative is to select private farms for demonstration sites and to use these for carrying out extension activities.

G. Selection of Model Demonstration Farms: The procedure for selecting demonstration farm sites should be modified. Prior to seeking final government approval, input should be obtained from USAID Missions, NGOs (including FTF, Private Farmer Associations and other organizations) in addition to the MOA.

Action Responsibility: MASHAV Experts, MASHAV & AGRIDEV, Israeli Embassies, local Governments and Local Farm Chairmen.

4. "Buy America" Procurement Requirements

Conclusions: In at least two cases, the procurement process has held up project timetables, either because equipment from the U.S. was slow to arrive or waivers were slow to obtain. The U.S. equipment was less adaptable and more difficult to service and maintain than Israeli equipment.

Recommendations: The dairy, irrigation, and other equipment installations were designed by Israeli technicians and matched Israeli equipment availability (small dairy operations). MASHAV is instructed to "Buy America" whenever possible; however, procedures for obtaining waivers allowing purchase of Israeli or host country equipment should be processed expeditiously by USAID when necessary.

Action Responsibility: USAID and MASHAV

5. Dissemination of Information

Conclusions: Project personnel have worked with other groups to share information and promulgate information about project findings. Two good examples are the TACIS report (Appendix E) and the vegetable production manual (Appendix F) prepared by Winrock International with assistance from MASHAV personnel. The TACIS report presents a scenario depicting profitable programs for the two demonstration farms in Uzbekistan. The report presented a positive picture for both farms if proper management can be carried out.

The manual prepared by Winrock International describes the operation at the Akhmad Yasawi Farm by defining yield potentials for various vegetables and presenting a management program for obtaining such yields.

Both documents are quite useful to privatizing farms and policy makers in the country. The cooperators (MASHAV, Winrock International, and TACIS (European Union) should be commended for these joint undertakings.

Recommendations: The Expert Economist, working with the production experts, should continue to prepare similar materials (both in cooperation with other organizations and independently) to promulgate the potential profit advantages of the management systems being implemented.

Action Responsibility: MASHAV, Israeli Experts

MAIN LESSONS LEARNED

1. Special care is necessary in selecting demonstration sites in order to meet project work goals and to facilitate and streamline the work of long-term experts.
2. Programs that have a rapid economic response (such as the mini-dairies) receive early acceptance in the CAR.
3. Where a "working counterpart" is identified for demonstration farms, project progress is more likely to be sustained after the departure of the Israeli Expert.
4. Work conditions in the CAR/Georgia present difficult conditions (theft, lack of funding by host, motivation) and are often more complicated than those experienced in some other developing countries.

I. PROJECT BACKGROUND, PURPOSE, AND OBJECTIVES

The Cooperative Development Program assists developing countries in applying Israeli experience in the use of modern technologies, research, and applied science for development in selected areas. Major areas of offerings are in agriculture, medicine, and education. CDP activities are administered by the Center for International Cooperation of Israel's Ministry of Foreign Affairs, known as MASHAV.

A. Background

In 1988, USAID and MASHAV agreed to expand Israeli linkages and the flow of technical assistance and training from Israel to developing courtries under the Cooperative Development Program (CDP). Priority areas of development include improved management of water resources, promotion of efficient irrigation, high value horticultural production, adaptive agricultural research, improved agricultural extension, land conservation, agroforestry/reforestation, crop intensification in arid and semi-arid zones, women in development, development of cooperatives, leadership development, aquaculture, livestock, post-harvest management, public health, health-care administration, and regional and rural development.

The CDP management responsibility is in the Global Bureau of USAID and is managed with close consultation and coordination with other USAID/W offices and USAID Missions, with the Department of State, the American Embassy in Tel-Aviv, the Embassy of Israel, and with MASHAV and developing-country officials. Israeli management of the CDP CAR/Georgia is assisted by a management committee consisting of representatives of the three main contributors to the program: MASHAV, CINADCO, and AGRIDEV. The three person steering committee meets every three weeks to discuss the program happenings (more often if needed). AGRIDEV serves as the implementing agency for the program in the CAR/Georgia

Programming for the CDP Central Asian Republics and Georgia was established in late FY 1992, with $2 million USAID funds. It expanded to its current scope in FY 1993, with an additional $4.5 million USAID funds. That effort comprises a three-year program of assistance for Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, and Georgia. The 1995 program expands CDP activity to a special CDP for Turkmenistan and Uzbekistan utilizing the resources of Turkey (in addition to the U.S. and Israel) in a Quadrilateral Program. The FY 1995 addition also extends CDP assistance to Tajikistan. USAID funding through FY 1995 totals 11 million, and the FY 95 budget includes 3 million for the CAR/Georgia and 1.5 million for the Quadrilateral Program (no USAID or MASHAV funds support Turkish assistance under this program). MASHAV funding through FY 1995 totals $$4,416,000, and the FY 95 budget includes $1.5 million for the CAR/Georgia and $.75 million for the Quadrilateral Program.

B. Program Goals and Objectives

The changes which occurred in the countries of Central Asia and Georgia when the former Soviet Union dissolved brought about the establishment of diplomatic relations with Israel. Interest in assistance from Israel evolved, especially in the areas of agriculture and rural based support institutions. Israel's scarcity of land and water accompanied with optimization of these resources in arid conditions, as well as Israel's achievements of accelerated economic and social development, were of interest to countries of the CAR/Georgia. The goal was to apply limited financial resources, in combination with Israeli funding and technological and scientific expertise (in fields such as irrigation, field crops, plant protection, and livestock husbandry), to improve the incomes and overall profitability of farms undergoing the transition from centrally managed to commercial operations. Training and technical assistance were linked together in viable projects in each country. The central theme was that CDP assistance was to demonstrate that those farmers and groups of farmers who opt for market-oriented production will realize incomes greater than those that continue to operate with centralized systems.

The FY 95 program will: a) identify and strengthen activities with individual farmers, farmer organizations; b) structure the demonstration farms as self-managed and independent profit centers; c) emphasize and accelerate the development of supporting extension materials/documents; d) expand demonstration and training activities by on-farm extension work and special training activities to targeted farmer groups; e) expand the use of computers in practical management of the demonstration farms; and f) identify and build linkages between the CDP and local training institutes, universities, and development organizations.

II. EVALUATION SCOPE OF WORK AND METHODOLOGY

A. Purpose of the Evaluation

The purpose of the evaluation was to assess the appropriateness, delivery, support, and effectiveness of Israeli technical assistance and training provided to the Central Asian Republics and Georgia under the USAID-Israel Cooperative Development Program (CDP CAR/Georgia). The report is to provide a detailed assessment of training (both in-Israel and in-host country), and of the effectiveness of long-term experts and short-term consultants. Evaluation scope of work is included in Appendix A and the travel itinerary is in Appendix B.

B. Literature Reviewed

Prior to departing for Central Asia, the team collected project documentation from both MASHAV and USAID. Additional

documentation and reports were obtained from personnel in the countries visited. Significant documents reviewed are listed in Appendix D.

C. Persons Contacted

Interviews were conducted by team members (both individually and in concert) with MASHAV (Israel) and USAID program staff. In Israel, the team interviewed the Science Attache of the U.S. Embassy to Israel and MASHAV personnel who had recently returned from Central Asia. Visits were made to Uzbekistan, Kazakhstan, and Kyrgyzstan where contacts were made with personnel of the Israeli Embassy, USAID, appropriate host-country representatives, and other providers of development assistance. Appendix C lists major contacts made.

D. Site Visits

Demonstration farms were visited in Uzbekistan (Akhmad Yasawi and Akurgan), Kazakhstan (Alma Ata, Kunarli) and Kyrgyzstan (Alga and Dustok). In addition the work of the Israeli Economic and Marketing Experts was reviewed. When possible, attention was given to visiting the work sites of participants of training courses of MASHAV (both in-country and in-Israel). Medical personnel who had received training in Israel or in OTS courses were also interviewed.

E. Interviews with Participants of Training Programs In-Israel and In-country

Participants of courses were interviewed individually and, when possible, their supervisors were contacted for input regarding the perceived success of the training program. On the average, the team interviewed 9 participants of in-Israel courses from each country (of a total of approximately 170, 150 CDI) trained over the 3-year period. Interviews were both individual and in small-groups and covered the training process through the selection process, course content (quality and appropriateness), logistics, utilization and overall usefulness, and follow-up. The team attended an opening of the "Shalom Club" in Uzbekistan attended by over 100 members of a potential of 170 eligible participants (graduates of in-Israel or in-country MASHAV courses). Medical personnel who took courses in Israel and OTS courses were not a part of the CDP but were included as a part of the MASHAV evaluation. The training outcomes of these participants provided additional input to the overall assessment of MASHAV'S training programs for the CAR/Georgia.

F. Evaluation Team Composition:

The Team consisted of a representative from MASHAV (Shimeon Amir) and a consultant for USAID (Rodney J. Fink).

III. PROGRAM OVERVIEW, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

A. Program Overview

The team found well-qualified experts placed in the field by MASHAV and a good support system supplied by MASHAV, CINADCO, AGRIDEV, and the local Israeli Embassies. Work conditions in the CAR/Georgia are difficult, but the experts have been learning to work within the system. The demonstration farm activities, a major component of the work, have achieved varying levels of success, depending on the financial capability and willingness of their cooperating counterparts. The most progress is apparent where the expert does not work for success in isolation, but works through the participating "real-life" partners in the daily operation. In those operations where the local partner is doing the best he can in meeting his project obligations, the success of the project is assured (although sometimes not as fast as the local experts would like). Of the 6 demonstration farms visited, 2 were on schedule; 2 were progressing, however, behind schedule; 1 had experienced many problems, with little apparent meeting of objectives; and 1 hadn't started. Given the new development experiences of these countries, the evaluators considered the overall accomplishments of these programs to be quite good.

Training programs were well-received by participants of all countries visited. Contact is maintained through follow-up activities (for a breakdown of numbers of all trainees in Israel, refer to Appendix G). The Evaluators attended the first meeting of the Uzbekistan "SHALOM" Club, enthusiastically attended by over 100 participants of MASHAV courses. There was enthusiasm for in-Israel and OTS courses for all areas of training from Israel provided either through, or separate from, the CDP.

Especially gratifying was the networking relationships between the CDP and other NGO and government organizations. For example, a great deal of sharing between Farmer to Farmer (FTF) implementors, TACIS Program (of European Union) and other organizations was taking place. This sharing of information and programming was beneficial to the donor organizations and the recipient host country personnel. Using information from the CDP farms in Uzbekistan (Akhmad Yasawi and Akurgan), the TACIS Program (European Union) prepared a very useful financial analysis for use in the country (see Appendix E). In addition, Winrock International prepared a vegetable production manual using input from the same Akhmad Yasawi Farm (See Appendix F).

B. Findings, Conclusions, and Recommendations

1. TRAINING PROGRAMS IN AGRICULTURE (IN-ISRAEL AND ON-THE-SPOT)

FINDINGS: The training in agriculture was undertaken at the beginning of the CDP CAR/Georgia to complement the activities

of the 7 planned demonstration farms. The courses in Israel were "tailor made" to meet participant needs as were the OTS courses offered (plans for other OTS courses are in the planning stages).

CINADCO provided the team with lists of courses and accompanying lists of participants in courses offered. In addition, translated summary and evaluation reports were received. These provided a useful source of information to study prior to the Evaluator's country visits. The following courses were offered in Israel by the CDP:

1993

1. Technological and Economic Aspects of Milk Production
2. Vegetable Production
3. Irrigation Methods

1994

1. Agricultural Development and Management
2. Vegetable Production
3. Irrigation Methods and Technology
4. Aspects of Technology and Economics in Dairy Production and Management

1995

1. Private Farm Development & Supporting Systems
2. Agricultural Field Services & Greenhouse Production Practices
3. International Course on Agricultural and Farm Machinery Operations and Management
4. Grain Storage
5. Agricultural Development and Management

In addition to participating in courses taught in Russian, a few participants from the CAR/Georgia took international courses offered in English (courses included information systems, development of arid zones, agrometeorology, and trade unions). All transportation expenses are provided by the program for CDP courses offered in Russian. Approximately 10% of the participants are women.

The agricultural courses for participants from the CAR/Georgia are designed and planned to meet the needs of the present and future members of the farms undergoing privatization. First priority for being selected to a course in Israel (for those that are qualified for admission) was given to those that could contribute to the practical work of the farm. Some early CDP courses provided orientation courses for individuals in, or soon to assume, leadership positions on the six demonstration farms. Later courses were conducted to meet the needs of key positions on the farms.

The high level of participants selected with advanced degrees (PhD, for example) is one of the positive characteristics of the Soviet rule and heritage. Individuals were given the opportunity to pursue advanced degrees on a wide scale. Not all participants taking courses with the PhD were from research institutions or universities, as some held practical and executive functions on some of the cooperative or state farms. A

random survey of three courses revealed that well over half of the participants came from farm or other production units. This large participation from production units is a very encouraging achievement.

Practically all participants held academic degrees and some held advanced degrees and were university professors or research institute members. In randomly selected courses, the numbers of participants with the PhD degree ranged from 1 in 24, to 9 of 23. Likewise, from a randomly selected group of courses, the number of students assessed by the training institutes as outstanding ranged from 3 of 24, to 7 of 23.

Many of the participants occupy leading positions in their countries, including the heads of colleges or institutes, heads of departments of ministries, high academic positions (including the Dean of a Faculty in a university). Participants from demonstration farms, taking courses in Israel, generally had academic degrees (some advanced degrees) and several were Veterinarians.

Training for CDP CAR/Georgia courses is, to a major extent, "project oriented," and the training in Israel is in constant interface with the practical work in the field (in connection with the Israeli Experts and local directors). In this manner, the follow-up is continuous. In addition, the follow-up is being carried out by the general practices of MASHAV which include the following:

1. End of course written report by the director of the course following summation exercises with the participants
2. Contacts with the Embassy and the Shalom Club
3. Meetings with the trainers visiting the countries on consultancies or OTS courses
4. Bulletins of training institutions and the "Shalom Magazine"
5. Random survey to be carried out within two years after course completion (planned, not yet carried out for CDP CAR/Georgia)

The courses averaged 5 weeks in duration and the number of faculty and staff to have contact with the students was between 15 and 22. Staff was composed of those with academic credentials (including a professor and scientist from an agricultural research organization), several MOA personnel, and members of a Kibbutz and several Moshavs. Courses stressed a practical approach with application of knowledge and acquisition of skills.

Course evaluations revealed that participants, even though coming from communist countries where freedom of expression was not common, didn't hesitate to make critical remarks about the program (questionnaires given were anonymous).

Participants expressed a high degree of satisfaction with the course content, organizational matters, and program management. Among critical remarks voiced were: need for more homogeneity of the participants in a given course; more practical components; more courses in marketing and "free market" economy.

Written comments often supported the indications on the questionnaires. Some of the critical points mentioned in the reports were also revealed by former participants in meetings held by the evaluation team. MASHAV & CINADCO should have course directors undertake a systematic review of comments by participants and provide more responsive correction to these complaints (when valid). A salient example is the recurrent mention of lack of sufficient homogeneity in their background and their expectations from the courses.

Five Ministry officials (MOA Kazakhstan) briefly discussed the training of their personnel in Israel (and OTS). The Vice Minister presented a request for "turn-key" model farm facilities to be used for training Kazakhstan farmers. The Deputy Chairman of Leading Management of Staff and Consulting (who programmed students for training) gave an in-depth assessment of the training program with suggestions for change. She also outlined course priorities and provided two returned trainees for interview. Among her recommendations were to reduce the average course length to 3 weeks and to increase the number of courses on business aspects of agriculture, while decreasing the numbers of production agriculture courses. Based on the good technical expertise of the country's educational system, this seems like good advice.

Participant Selection: KAZAKHSTAN - Letters are sent from the Ministry to each rayon seeking candidates for each course. Nominees are submitted from the Ministry, and they submit names and supporting documents to the Israeli Embassy. From these nominees and those received directly from the Ministry, selections are made and forwarded to MASHAV for their consideration and selection. Lack of sufficient advance notice has been a problem part of the time. Candidates accepted for a course need at least one month of advance notice for paper processing and preparation.

Participant Selection: KYRGYZSTAN - The Ministry notifies oblasts of course opportunities, and the oblasts send nominations to the Ministry via Israeli Experts. The Ministry has been very defensive in selecting participants to the extent that all participants are of Kyrgi ethnic background (not Korean, Russian, German, etc.) If ethnic participants, other than Kyrgi, get on the list selected by MASHAV, the Ministry conveniently determines that the selectee is either sick, unable to leave work, or has family problems. In at least one case, the net result was that only trainees of Kyrgi ethnic backgrounds attended the courses in Israel.

Participant Selection: UZBEKISTAN - Course offerings are sent from the Ministry to Oblast Ministries, and nominations are made for each position. The Ministry has between 2 to 3 candidates to choose from for each opening. Future courses suggested are for agricultural management, courses for private farmers, and courses for cotton production. Management and leadership courses rank high. Few women are selected, and the Ministry solution for training more women was to offer a special

course for them, however, only one week in length. According to the officials, "women couldn't be away from home any longer than one week," an opinion not shared by the evaluators.

Several students expressed a desire to spend up to a week living in a Moshav or a Kibbutz as a capstone for their training experience.

Participant follow-up is maintained through a valid system of periodic contact by MASHAV (Jerusalem) and the Embassies. In the host countries, "Shalom Clubs" are being formed as a regular means of contact and interaction. The level of activity of the clubs varies between countries but the activity appears to be going well. The team attended the first meeting of the Uzbekistan "Shalom Club" and viewed an enthusiastic and capable group of participants who were pleased with their involvement in the program.

Courses Other than CDP-Generated Courses (Offered in English): Some participants are nominated for regular MASHAV courses which are offered in English. In these courses, the participant (or their sponsor) must provide transportation to Israel. Reportedly several students were qualified in English and were recommended for courses, but were unable to attend because they lacked transportation funds. The evaluators believe that efforts should be made to find transportation expenses, especially for cases where the training serves the bilateral objectives of USAID or MASHAV.

Courses in Medical Topics (In-Israel and OTS):

Almaty Medical College: MASHAV has conducted training programs (not part of CDP) for faculty of the college through courses in Israel (30 nurses and 30 Doctors as well as in-country, on-the-spot courses). The President and Vice President of the college gave "high-marks" for all training received. Especially noted was the willingness of the trainers to adjust the training to meet the needs of each individual. The participants in medical courses have been fairly equally divided between men and women.

Ministry of Health (Uzbekistan): Twenty physicians took a course in Israel (Physicians from many oblasts), and they have employed the use of para-medics in their system (based on Israeli pattern). Two nurses came from Israel and gave a nursing management course to 33 Uzbekistan nurses. Ten Uzbek nurses are now going to Israel in November for a course. All aspects of the medical training were evaluated by the participants as being very effective and appropriate with many aspects directly applicable in the CAR. Many ex-participants spoke of their visit to Israel with gratitude and emotion.

TRAINING CONCLUSIONS

USAID and MASHAV should be pleased with the positive response to the training courses offered. Many examples of implementation (and planned future implementation of training

principles) were cited by participants. Problems with the training components were minor and are listed only to provide a basis for improving a currently "good" program.

1. Training courses in Israel were accepted with enthusiasm by participants from countries visited. Returned trainees felt that CDP courses in economics, management, entrepreneurship, and agribusiness should have priority over production courses.
2. The need for more homogeneity in courses was raised by some participants, as was the desire for a "practical training component."
3. Instructors in Israel reported high quality participants.
4. The Israeli Embassies and MASHAV must insure that participants are selected on basis of "professional need," not ethnic background. Likewise, the enrollment of women in the courses is low, even though women in CAR/Georgia are actively involved in agribusiness.
5. Farm level management and entrepreneurship training is needed at the farm level. Such training would complement USAID's work at the macro-level. Working closely with USAID Missions would ensure that policy issues are presented with a united approach to participating governments.

TRAINING RECOMMENDATIONS

Training programs have been conducted well and should be continued, possibly expanded. MASHAV has instituted a follow-up process for graduates which is operating effectively (instituted since the last CDP worldwide evaluation). The following recommendations may help improve the program:

1. Future allocations for training should provide more training in economics, management, marketing, entrepreneurship, and agribusiness, with less emphasis on production agriculture. Integrating more agri-business into the current production courses would be useful as a partial alternative. Likewise, adding a component for some participants to work with a cooperative or private family business (accompany a private farmer/agribusiness person in his daily activities for a few days) would be useful. Sufficient resources should be allocated for tailoring courses to meet "specific needs" of some participants (meeting particular job/demonstration unit responsibilities).
2. MASHAV needs to insure that participant selection doesn't discriminate against ethnic groups or women. More women should be selected for training.
3. Interaction between members of Shalom Clubs and USAID "Net" clubs should be encouraged and nurtured. Bringing together those who have studied abroad is a viable means of networking with talented people.
4. The policy of requiring CAR/Georgia training participants of courses offered in English (or their sponsoring organization) to pay their transportation to courses in

Israel, should be reevaluated. USAID funding might be appropriate for those students whose training promotes USAID bilateral goals and objectives. Travel for training that meets CDP objectives should be budgeted within CDP funds (for those who can't provide their own travel for English courses).

5. Non-agricultural training programs in Israel could complement USAID Mission training needs (health, management, & education, for example). The Israeli Embassy should share information of course offerings with USAID Missions to facilitate such programming where appropriate.

2. STATUS OF LONG-TERM DEMONSTRATION FARMS

AKHMAD YASAWI, UZBEKISTAN

The demonstration unit consists of 46 hectares on the Akhmad Yasawi Kolkhoz, a collective farm of 5,000 ha. The 5,000 ha farm consists of 3,600 ha of irrigated land and has a community of about 12,000 people of mixed Uzbek, Kazak, and Korean background. About 45% of the Kolkhoz population (over 5,000 children) are under 18 years of age. The Kolkhoz consists of 8 villages and 7 schools. The main crop is cotton, and there is a dairy census of 1,900 milk cows. Typical services such as clinics and other medical services, supply stores, flour mill, and other support services are available. Approximately 2,000 members of the community are employees of the farm. Other members include the school children, retired members, support workers (medical, teachers, etc.), and a significant number of residents who work outside the farm. The Kolkhoz Chairman described the large percentage of people working directly in agriculture and recognized that, in the long-run, they will need to reduce the percentage of workers engaged directly in agriculture from the current 50% to 10%. He also recognized the necessity for alternative employment as this shift occurs.

Eight employees of the Kolkhoz attended courses in Israel, and the two interviewed (Chairman and Deputy Chairman of the Kolkhoz) were pleased with what they had learned. The Chairman cited the appropriateness of the training for participating members of the Kolkhoz. In addition to the technical information, one participant noted the presence of a manufacturing unit on a Kibbutz and mentioned the relevance of such opportunities on emerging stock farms in Uzbekistan.

Micro-irrigation is used on the Israeli irrigation demonstration farms--an effective technology that brings water to a plant's root structure through a low pressure system of drip lines or mini-sprinklers. Irrigation occurs frequently over a long period of time. Advantages include a more even, consistent application of water, accurately controlled rate of application, efficient method of applying fertilizer, less fruit damage by over-watering, use on steep slopes, and a savings in energy (from

pumping) and water use. The systems can be operated manually or by computer. Disadvantages include high start-up costs, physical and mechanical blockages, and the need for a strict maintenance regime (good management skills).

The annual reports of the expert included many problems associated with the project. Since the project must depend on Kolkhoz labor, planning for harvest must take place. In one instance, a cucumber harvest, the workers arrived without a supervisor and each worker harvested about 40 Kg for himself/herself before harvesting for the general project. The workers decided to take 25% of the vegetables as their share and then proceeded slowly with the harvest, leaving the harvested vegetables in the sun and heat for hours before being transported to storage. In another situation, a tomato harvest, approximately one-third of the crop was either stolen, or rotted in the field. The workers can't be totally blamed as they had been without salary for over 3 months.

The CDP demonstration farm deals with high-value crops such as onion, potato, tomato, and cabbage. The unit has effectively introduced and demonstrated new irrigation technology (pressure systems), improved water-use efficiency, provided diversification of crops, compared local and foreign varieties of crops, improved profit margin, improved management practices, and has provided marketing advisories. Of special interest is the utilization of 35 families to carry out the basic tending and harvesting of the crops on a continuous basis. This innovation was introduced in the second year, following the failure of the Kolkhoz to supply enough workers during the first year. Basic tillage and input supplies are provided by the Kolkhoz; however, the regular nurturing of the crop by the same families, each with an assigned land area, has provided production continuity. The result has been an increase in yield and improved sense of accomplishment for the families involved. As an incentive for their work, the families retain a significant percentage of the produce over assigned quotas, thus increasing family income. Prior to identified family involvement on the project, lack of attention and theft of produce had been a major problem. The assigned families effectively guarded the territory they were responsible for.

Even with all the problems associated with managing the project, considerable improvements in yields were shown. The following table shows the comparative yield between the demonstration unit and the Kolkhoz. Yield increases of 300%, over Kolkhoz yields were obtained with some crops. Part of the increase is the result of the improved irrigation technology, and part is because of the management experience of the Israeli Expert.

CROP PRODUCED	DEMO UNIT, TON/ha	KOLKHOZ, TON/ha
Potatoes	29.7	10
Tomatoes	55.8	30
Cabbage	40.9	23
Cucumbers	25.1	8
Onions	30.0	16.4

Significant improvements of water use were accomplished on the unit with a reduction of water use by 50% or more. Yields of crops are often doubled and sometimes increased by up to 4 times (potato, for example). Less post-harvest loss has been noted because of the "sense of ownership" by families assigned to specific land. They know that lost produce is lost family income. Some of the increased yield is due to improved irrigation techniques and partly due to the knowledge and experience of the Israeli Expert. The evaluators visited Tashkent bazaars and observed plentiful supplies of fruits and vegetables. Whether the duplication of the cost of the irrigation installations can be justified depends on the future development of the marketing process (including export opportunities). The benefits of improved management practices are useful and transferable, even with the traditional irrigation systems being used.

The European Union TACIS Program (Water Resources Management and Agricultural Production in the CAR) selected this project for a technical and financial evaluation of the systems being demonstrated. Their notes are attached as Appendix E. Likewise, Winrock International, through an FTF Volunteer, prepared a technical publication describing the vegetable production techniques used. This document, prepared in Russian, has been distributed to the MOA, Kolkhoz and other organizations for their use (See Appendix F for English translated version).

The project component is meeting the objectives of demonstrating to the Kolkhoz management, government officials, and other farmers the benefits of utilizing modern technologies and management. Ministry officials are involved in the program and, likewise, appreciate the contributions made. Individual farm workers (about 35 families) have recognized the importance of incentives offered by having a personal responsibility (and returns) of the crop on land they manage. The Kolkhoz has not provided a permanent or suitable "counterpart" for the continuation of the program but has verbally committed to maintaining the output of the program's various components.

The program at Akhmad Yasawi has demonstrated what it set out to do, which is to show the benefits of new technology and improved management practices for production of high value crops. The project will meet the intended objectives in the 3-year project life. If the land area (46 ha) were to be privatized, or placed into a separate unit with financial backing, continuation of a follow-on project emphasizing private production and marketing of quality produce would be worthy of consideration.

Adding post-harvest facilities to provide a "value added" component to the produce has the potential for providing additional employment, more income, and added incentive for utilization of high technology production methods.

Project personnel and the Embassy of Israel have been successful in sharing the results of the program with other development projects (Winrock International and TACIS, for example), thus tending to maximize multiplication of the results. The project has successfully demonstrated the value of technology and management in improving crop yield, quality, and farmer incentives, while dramatically reducing the amount of water required to produce high-value crops.

CONCLUSIONS:

1. The project is meeting its intended objectives. Excellent production has been achieved, and "farmer involvement" has increased production, increased family income, and effectively demonstrated modern technology and management.
2. Motivation to produce high yields of quality produce was difficult to achieve because little incentive exists for Kolkhoz workers to increase yields and improve quality. Positive attitudinal changes are now apparent by those involved in the project (Chairman, Deputy Chairman, farmers) but, until now, only an awareness had been achieved with this project. There is still a need for changes in general conditions of the economic life of the people.
3. The initial objective of the program, demonstrating the effective use of modern technology and management to produce "high value" vegetable crops, will be met by the end of the planned three years.
4. The personnel of the project (Advisors, Kolkhoz personnel, Ministry, and others involved) have been successful in carrying out the intent and operation of a useful program. The high visibility of the project has the potential for influencing the development of private agriculture in Uzbekistan.
5. Project leaders should move rapidly to identify a member of the "farmers group" or leader from the Kolkhoz to take responsibility for sustaining the technical leadership of the current Israeli Expert. The CDP should provide the necessary training for the person selected, who, on project conclusion, will assure sustainability of the program.
6. The site is a productive unit and a good candidate for privatization. If, for example, ten farmers were willing to take a risk and buy approximately 4 ha each, they could be the beginning of a private farmer group. If such interest exists (on the part of individual farmers, the Kolkhoz leadership, and the Israeli experts), suggested efforts to privatize the area would include the following):
   A. Identify 10 farmers wishing to be private farmers and willing to take the risk of ownership.
   B. Develop a business plan for the farmers group and help

them secure loans for purchase of the land (on an individual basis) and for a common service and merchandising area.

C. Help the group develop management and marketing so the system will work. The Economist and current irrigation expert can play key roles in this process.

D. Expand utilization of the demonstration farms to obtain a multiplier effect. Continue to offer (and expand) field days for farm business managers/workers and members of other donor agencies and NGOs.

RECOMMENDATIONS

1. The identification of a counterpart, to take over the role of the Israeli Expert, should be done immediately (by Kolkhoz and Israeli Experts). The counterpart should be trained to carry out management functions and to coordinate any follow-on efforts.
2. Follow-on activities for the demonstration farm should be developed to insure future liaison with Israeli experts and possible privatization of the site.
3. Future activities should emphasize the development of markets and private or leasehold possession of land by individual farmers.
4. The site should be utilized extensively for "extension activities" for farmers, government, and other development assistance providers to maximize the "multiplier effect" of the project.
5. Involved project personnel should be commended for a job "well done."

AKURGAN DAIRY FARM, UZBEKISTAN

The project site at Akurgan was selected from about 12 farms visited because the Chairman of the Kolkhoz was known for his independent management practices and was committed to privatization. The Akurgan Sovkhoz is very old and the milking equipment, buildings, and general state of conditions were poor when the site was selected. Capital is very limited and progress has been slow because of the time required for the farm to acquire capital for infrastructure to support the mini-dairy, feed center and model farms. The farm is becoming a "stock company." Ten-thousand people live on the 8 settlements of the farm which consists of 5,000 ha with 6 departments. Cotton is a major crop, as is wheat; many other crops, including vegetables, are grown. The farm has adjunct businesses of milk-processing, brick-making and a winter operation of hand-made carpets. Sixty percent of the adults work on the farm (about 3,000 people), and the others do support work or have jobs in Tashkent.

Since the expert has been working with the farm, annual milk production has gone up over 10% per year (much progress still to be made). Computer software has been introduced which improved herd selection and feed efficiency. Problems such as theft of

feedstuffs, poor quality roughage, shortage of veterinary materials, poor financing and poor general conditions still exist.

The mini-dairy is operating and selling goods in the local area and has tried to make arrangements to sell in Tashkent, where markets are better. The dairy is not licensed and until money is raised to pay the license fee (imposed by the Ministry of Health), active marketing efforts in Tashkent will be difficult. The mini-dairy equipment is operating well, products produced are well accepted, and the operation, according to the farm manager, is adding to the farm income. The equipment is operating one shift per day and is housed in buildings built specifically for the facility. According to the farm director, 10 similar mini-dairy facilities have been ordered by other farmers in the region.

The feeding center facility, along with short-term seed storage, is being renovated and should be ready to house the equipment in another 60 days. The facility will process feed for the major cow herd and for private farmers associated with the unit.

To meet the concept of private farming, two farmers (employees of the farm) were selected to set up small dairy farms. Each farmer has been assigned 1.5 ha, and a milking facility for housing 30 to 40 cows is being built on each farm. In addition, the farmers are each building a new house and look forward to moving on their own land. The farmers have obtained loans to build their houses, buy animals, and build the housing for the milking parlors. The central feed facility will deliver the feed to the farmers' herds, as well as accepting the milk for marketing. The charge for feed will be reconciled with milk sales periodically (probably bi-weekly or monthly). According to the Israeli Expert, the approximate investment per family is $45,000 for equipment (provided by program), $8,000 for dairy cows, $20,000 for construction (total of $73,000), plus land provided by the farm. The Israeli Expert said that with proper financing, other farmers could get started, make a good family living, and pay off the loan. Additional land is available to allow up to 100 individual farmers to go into the "specialized farming operation." With the current price of milk, a complete loan could be taken and paid back in a reasonable period of time (according to Israeli Economist). Jealousy towards the two farmers who are being given the equipment is of some concern.

Progress has been slow, but, with the cooperation of all involved, a system of privatizing dairy farmers (with support from the main-farm service center) is evolving. The approach is much different than the other demonstration farms and will provide an interesting model to watch and compare. Both farmers and the farm manager have been to Israel and feel that a system patterned after the Israeli Moshav has promise in Uzbekistan.

The Deputy Minister of Agriculture assured the team that he would accelerate the construction phases and work with the Minister of Health to obtain a license, allowing marketing in

Tashkent. The progress of the "model farms" should be monitored closely, and, if the concept is successful, steps should be taken to organize other farmers in developing a business plan, obtaining financing, and proceeding with the purchase of land, cattle, buildings, and equipment. MASHAV Experts need to assist with the marketing process and perhaps identify grocers in Tashkent who would be willing to make a contractual agreement for future purchase of produce from the farmers (this may require helping them develop business plans to obtain loans for acquiring cooling equipment, etc.) to perpetuate the privatization process.

Appendix E, an analysis by TACIS, contains a present and future profit scenario for the dairy. Their analysis shows that there could be a profitable return to the operation with improved feeding, veterinary regimes, and stock selection.

CONCLUSIONS:

1. The project is behind schedule but moving toward meeting planned objectives. Slowness of the host country MOA and farm officials has placed the project behind schedule.
2. The mini-dairy has been an effective operation and will potentially be more profitable when licensing problems are solved.
3. The cattle herd would benefit by better selection (including culling), improved feeding, and improved veterinary regimes.
3. The "small farm models" are an interesting approach and provide a model for future development.

RECOMMENDATIONS:

1. Facilitate the action of government officials (MOA and Ministry of Health) to solve the licensing problems which restrict legal sale of goods in Tashkent.
2. Continue with the "small farm" developments underway, and, as they become successful, expand this program to other farmers. Experts (economist and dairy expert) should provide assistance with developing business plans for obtaining financing as well as technical support.
3. Expedite the implementation of the feed center and the construction on the "model farms."
4. Emphasize the herd management and marketing components of the operation in order to improve production, expand markets and increase profit.

KUNARLI DEMONSTRATION FARM, KAZAKHSTAN

The Kunarli farm is a stock company of 8000 ha. There are 600 members of the stock company and three villages with a total population of about 2,000. The farm produces high value vegetable crops (cabbage, tomatoes, eggplants, pepper, and potatoes), lucerne, corn (including hybrid seed corn of Yugoslavian origin), grain, wheat, sugar beets, and houses 900 milking cows. The farm has been involved in a three-year project with the Dutch Government to increase the yield of potatoes.

Plastic houses have been erected and are used as "transplant nurseries" for getting vegetables off to an early start in the spring. The farm experiences cash-flow problems which are aggravated by lack of credit and failure of the government to pay for produce sold to them. They are unable to purchase production inputs (fertilizer, pesticides, improved seeds, etc.) as they owe the government 12 million tenge (at time of report, $1.00 U.S. = 60 tenge) for inputs. The government owes them 28 million tenge for delivered produce (milk, grain, etc.), thus leaving a net government obligation of 16 million tenge (over $250,000). In April, the government delivered gasoline in return for produce which had been delivered, as the government had no money for payment. When privatization started, 8 farmers took their share of land (3 ha) and broke away from the Kolkhoz. Their economic situation is reportedly very poor.

For nearly a year, MASHAV was unable to locate a qualified expert and this delayed the initiation of work on the farm. Even though Israel has many Russian speaking citizens, finding the combination of a specialist who speaks Russian and is willing to go to Central Asia is sometimes difficult, especially on short notice. The recruitment process appears to be moving more rapidly now, than in earlier times, as experts share the experiences they have had with colleagues in Israel.

Recently, the Kunarli Farm Chairman indicated they were unable to meet their admitted obligation of providing a 24 hr. water storage basin. The project site has been identified and consists of 36 ha of land plus an existing greenhouse area (one structure to be utilized for the project). The Israeli expert is now in place and ready to nurture the project after the issue of water storage being raised by the host farm is resolved. The Farm Chairman at the time the selection of the farm was made has died, and the immediate successor has been unwilling to meet all demands of the project (although he may ultimately agree to the demands).

Although the farm had previously agreed to provide funds for a holding basin which can provide a 24-hour water supply, the Chairman of the Farm reported that funding is a problem. He acknowledged the responsibility for construction but said it would cost $120,000 and he didn't have the money. When the project was scheduled to start (one year ago), he said the money was available. Now, economic conditions are worse, and he can't raise the money. He wants the project to provide him the funding for the basin. The price stated ($120,000) seems excessive (by about 10 times) for the structure proposed, when compared to other construction (either here, in Israel, or in the U.S.). The Israeli Expert has outlined lower cost alternatives, including the use of a plastic lined facility, which would lower the cost.

CONCLUSIONS: Based on the inflated price that the Kolkhoz Chairman is demanding for the water basin, the evaluators feel that further cooperation might bring additional problems and recommend finding a new partner. Factors to be considered

follow:

1. The Kunarli farm, agriculturally, is a suitable site, one of many in the area. Other than time and energies, no funds have been invested. The lack of an Israeli expert delayed the project implementation for over a year but a qualified expert is now assigned (and on-station). The Chief Agronomist is motivated and interested in the project
2. The current Farm Chairman is unable (at the time of our visit) to provide the funding needed ($120,000 according to his figures) for his acknowledged obligation to provide a water basin. He asked the team if USAID and/or MASHAV would provide the funding, indicating they would have to provide funding if the project was to continue
3. The death of the original Farm Chairman has contributed to the problems facing this site.
4. Since the project hasn't really started, another cooperator could be found. There are many indications that this farm is privatizing very slowly. Since no funds have been invested on site, other opportunities should be considered. The Ambassador suggested placing a farm at ChymKent, a site agriculturally more similar to Israel. Selection of demonstration sites on a number of private farms (to be used as centers for extension activity) is another possible approach.

RECOMMENDATIONS:

1. The Evaluators suggest consideration for dropping the Kunarli demonstration farm site in favor of one of the following options:
   - A. Locate another cooperator, preferably in a site where pressure irrigation would be more likely to be widely accepted (with a water deficit area more like conditions experienced in Israel).
   - B. Make a mid-course adjustment in the program. Instead of developing one model farm, utilize the expert for "extension type activities," including demonstration sites on a number of farms. The assistance of FTF, USAID Mission, TACIS Program (European Union), and Private Farmers organizations could be utilized to help locate cooperators.
   - C. Continuation with the present farm site is an option if a satisfactory working relationship can be obtained.

ALMA ATA DAIRY FARM, KAZAKHSTAN

The Alma Ata Dairy Farm is a private stock company with 1,230 shareholders and 450 workers. Workers receive a salary and, in general, a small tract of land for a cow, garden, and other farm produce. If they don't work on the farm, they are not entitled to the housing and other benefits. Work output is good,

and production is above the average of other farms visited.

Descriptive information, provided by the Farm Chairman, reveals the region consists of a population of about 12,000 with 5 villages and an area of 56,000 ha. The farm has 18,000 ha of cropland plus 4,300 ha of irrigated land. Other land is desert pasture for sheep. Crops included (on the average): 1,000 ha of corn, 1,200 ha of alfalfa, 350 ha of potatoes, 400 ha of vegetables, 100 ha soybeans for oil extraction (oil cake from soya and whole beans are fed to cattle as well), 60 ha of sugar beets, and about 4,000 cattle with 1800 milking cows. The farm grows various kinds of cereal crops for grain--one thousand nine hundred (1,900) tons of these crops (of which 20% are wheat and 80% barley), are allocated to the dairy farm. In addition, there are 650 horses (100 race horses) and 400 hives of bees.

One major problem is the failure of the government to pay for crops delivered. Currently the government owes the farm about $1,000,000 dollars. Since the government is behind, the farm has been selling to other sources and, according to the Chairman, now has a daily income of $8,000.

The CDP has three components which are a mini-dairy, feed mill and mixing facility, and a modern milking parlor facility (in practice, assistance is provided to all phases of the farm's total operation).

The mini-dairy produces a number of dairy products and has opened a retail store which was crowded with buyers the morning of our visit. Products sold included yogurt, soft cheese, brine cheese, pasteurized milk, and related produce. A joint private Israeli/Kazak enterprise recognized the potential of the operation and provided a modern package filling system (not directly associated with the project) which is speeding up the packaging process. Payment of the equipment is provided by giving the vendor some produce in place of a direct cash payment.

Cattle records have been computerized, and a culling of unproductive cows is taking place (major cow herd has been cut by over 10% and more milk is being produced than before the cut). Although the feed mixing system was for the 200 cows used to support the mini-dairy, the system is being used for the entire dairy cow herd (as are computer records), so the entire farm is benefitting from the technology. Counterparts are in place ready to continue when the project ends. Farmers from throughout the country were invited in for two OTS courses to demonstrate the technology and management system (25 participants per course).

CONCLUSIONS:

1. The operation is progressing well. The Farm Chairman and employees are enthusiastically participating. The program has profitability, is assisting the privatization process, and others are learning about the operation.
2. The Israeli Expert has excellent rapport with the farm personnel, and the chances for sustainability are very good.
3. The technologies demonstrated have an excellent chance for sustained operation.

4. Computerization of dairy records has been an effective tool for helping to improve the dairy herd and the management of the operation. The process is carried out by local employees with enthusiasm.

RECOMMENDATIONS:

1. Continue the good work that is underway. Move ahead with the completion of the milking parlor.
2. Work with FTF and others to develop a marketing plan for dairy products and continue the "herd improvement" progress.
3. The operation is an excellent site to utilize as an "extension training center," and this phase of the project should receive priority attention. The success with marketing (both wholesale and retail) is especially adaptive for other farms, as is the utilization of the computer in maintaining herd records.
4. Project personnel contributing to program success should be commended for their work.

DOSTUK DAIRY FARM, KYRGYZSTAN

The Dostuk Kolkhoz is about 15 km from Bishkek and characteristic of others in the region. There are 4,500 inhabitants of which 65% of the working age members, work on the farm. The farm consists of 2,800 ha, all of which is irrigated. There are 650 milking cows and an equal number of heifers and bull calves for beef and for breeding. They have 3,000 sheep but plan to drop sheep production because of low profitability. The Kolkhoz allocates about 1,500 ha for growing fodder crops, mainly alfalfa (the main protein source), maize for silage, and grains. They store a large amount of barley grain for feeding the herd during the winter months. The remainder of the land is allocated to grain crops, vegetables, and sugar beets (an important crop with high demand). Government controls still hamper the ability of the farm to become more efficient by limiting the numbers of animals that can be sold each year.

Both the Kyrgyzstan Vice-Prime Minister for Agriculture and the Vice-Minister for Agriculture were optimistic about the Dostuk Dairy Farm operation. They were pleased with the progress and acknowledged their problems of supplying timely inputs, of good quality feeds (protein and concentrate, for example). They were especially optimistic about the anticipated output of the mini-dairy and voiced their commitment to accelerate the renovation of the area for housing the milking parlor.

The Chairman of the farm is pleased with the progress to date. A tour of the farm showed the building for the mini-dairy was ready for installation, and the area for the milking parlor was being prepared. The cattle (200 head) have been selected and everyone seems optimistic that the installation will soon take place. The bulk feed wagon is in use and all aspects of the project, although a bit behind schedule, are moving along well.

Semen from Israel: The Farm Chairman of Dostuk, as well as

the Chairman of the Alga Farm, indicated a strong desire to obtain semen from Israel (Israeli experts would like to see management and nutrition improved before moving in this direction). Although management factors can do much to increase production, improved genotypes are also a part of herd improvement. The team suggests a short-course on herd improvement using artificial insemination for area farmers and, as part of the program, provide semen for 50 to 100 cows to enable a working impact on the farmers' herds.

CONCLUSIONS

1. The installation of the mini-dairy equipment and completion of the milking parlor are behind schedule. Many operational problems have hindered the progress of the project; however, progress has been steady and the mini-dairy building is now complete, ready for installation of equipment.
2. Delivery of equipment for this, and other dairy operations, was held up because of the "Buy America" provisions of the program.

RECOMMENDATIONS

1. Facilitate the installation of the mini-dairy and milking parlor.
2. Emphasize the market development process as the mini-dairy comes on line.
3. Consider conducting a short-course for area farmers in artificial insemination to demonstrate the process and educate farmers on benefits of the program. Emphasize the need for a good nutrition program to accompany herd improvement.

ALGA FARM, KYRGYZSTAN

The Alga farm, located 25 km northwest of Bishkek, has 3,000 inhabitants with 85% of the workers being employed on the farm. There are 2,700 ha of which 2,200 ha are irrigated. They maintain 500 milking cows and 3,00 horses (for meat and riding). The main field crops are wheat, corn, barley, alfalfa, sugar beets, oil-seeds, and potatoes.

The Vice-Prime Minister for Agriculture revealed that the demonstration farm portion of the Kolkhoz had not produced well. (In his words, "the advice of the Israeli Expert did not fit local needs.") In reality, it appears that the advice of the Israeli Advisor required additional discussion and consultation regarding whether production of a high income crop or only wheat was best for the Kolkhoz. Many factors such as soil type, poor water supply, inputs, etc. were reasons for the lower yields. The Vice-Prime Minister further stated that they went along with the advice the first year but experienced a loss of 460,000 tenge (about $46,000) because of the erroneous advice. He didn't know about 1995 but thought this would be a bad year also as the advice had not matched the needs for top production. The Vice-Prime Minister demanded that USAID or MASHAV make up the

$46,000.00 loss so they can go ahead with the project. The Vice-Prime Minister stated that he would set up a special commission to make plans for this activity next year, especially if there was a loss for 1995 as he anticipated. His overall reaction was that with such losses, they would find it difficult to go ahead; however, his credibility was at stake so he did not want the project to end.

The Vice-Minister for Agriculture (lower ranking official) stated that the results from the demonstration farm were not bad and that responsibility for the reduced yield was the fault of the Kyrgyzstan side for not providing timely manpower, productive soil, water, and related inputs. He stated that their difficulty was due to the weak financial condition of the country. He was optimistic that conditions would be better in the future.

Both the Vice-Prime Minister for Agriculture and the Vice Minister of Agriculture had praise for the training programs that had taken place in Israel. They indicated the desire to stress courses in agri-business, economics, entrepreneurship, and management.

The farm manager was more optimistic about the progress of the farm and indicated a number of factors responsible for the loss of income. He stated the problem was of the farm's own making, and not based on the advice of the expert. Undesirable selection of crops, lack of electricity, water, inputs, theft of materials (batteries, etc.), all contributed to the low return. The manager was interested in proceeding with the project and recommended using the Korean vegetable producers as the key clientele for the work. The 1996 focus is directed to vegetable production on 13 ha leased to Korean farmers. All parties appear pleased with the proposed 1996 arrangement, although the agreement is still being negotiated.

Commitment of the Government and Alga Kolkhoz management has been lacking in the project. Verbal commitments have not been followed with action to correct problems (electricity, water supply, work crews, inputs, and related needs). The farm originally had about 80 German families that managed the work and, while these families were present (early in project life), the work went well. Only two German families remain, and the operational problems have increased steadily. With the departure of the German families, the yield of grains from the Kolkhoz decreased from 3 to 4 tons/ha to 1.5 to 1.8 tons/ha. Harvests of silage, lucerne, and other forages decreased from 4 to 5 harvests per season to less than 3. Other problems included lack of water for irrigation as promised, seepage of underground water (thus causing water-logging to the site). In addition the tractor assigned to the demonstration unit often disappeared and was used for unofficial uses. When early candidates for training in Israel were denied, the Kolkhoz refused to nominate other trainees. The new Chairman of the Kolkhoz appears to have a positive outlook on the project. He is encouraging its continuation and specialization with the Korean vegetable farmers who are leasing land from the Kolkhoz.

With the reduced operation for 1996, the MASHAV Expert should have extra time which could be profitably utilized by selecting some additional farms in the region (with the help of the Economics Expert) and assisting them with the production of high value vegetables, using improved levels of the accepted technology practiced in the region.

CONCLUSIONS

1. The working conditions on the farm have not been conducive to success. The present Alga Farm Chairman is in favor of moving ahead with the project and places responsibility for lack of success on the poor support provided by the farm.
2. Because of the limited success to date, consideration should be given to minimizing (or even dropping) the operation on this site.
3. The Israeli Expert has been diligent in carrying out his duties and the difficulties experienced appeared out of his control. He has been very patient in facing a difficult situation. A plan of operations for 1996 has been submitted to the local authorities outlining new direction for activities.

RECOMMENDATIONS

1. Unless assurance is reached that a successful demonstration can be achieved in the final year of the program, the program on the farm should be terminated and the Expert assigned to establishing demonstration sites on a number of farms for support of "extension type activities."
2. New directions (mid-term adjustment in program) may be in order for the Alga Farm. The scope of activity for the Expert should be directed to the vegetable production of the Korean farmers (assuming an agreement can be reached), and his activities should take on more of an extension role for the remaining year of the project. Area farms should be identified where he can concentrate on extension activities in the production of high value horticulture crops (private farmers preferred); farms should be identified with input from organizations such as Winrock International, VOCA, USAID Mission, and local Private Farmers Organizations. If an appropriate agreement with the MOA and Farm is not reached, consideration should be given to dropping the project site (minimize losses and look for a new opportunity).

SUMMARY OF DEMONSTRATION FARM ACTIVITIES

The experts assigned to the farms have worked hard to show the success apparent today. Success has varied and is largely dependent on the situation of the farm selected. Two farms (Alma Ata and Akhmad Yasawi) are moving along very well and meeting program objectives and purposes. Two farms (Dostuk and Akurgan) are progressing; however, they are behind schedule. One farm

(Alga Farm) has experienced many problems regarding support by the host and has made little progress towards meeting objectives. Progress on the Kunarli farm has been delayed because of lack of an Expert and more recently by the failure of the host to provide a water basin. Considering the difficult working conditions in introducing change, the evaluators concluded that the projects (in the total) have performed well.

SUMMARY CONCLUSIONS

1. Implementation of Demonstration Farms has been difficult because of inadequate support, lack of inputs, and operational problems (such as theft, lack of timely labor, lack of local counterpart, and lack of local funding for implementation).
2. Two of the three mini-dairies are in operation and have been marketing products in local bazaars. The Kolkhoz Managers like the production capability (of such products as yogurt, brine cheese, etc) of the mini-dairies and are looking for markets to enhance their profit.
3. The Akhmad Yasawi irrigation farm has successfully demonstrated improved yields of high-value horticulture crops using modern (micro-irrigation) technology and management practices. By assigning the care and harvesting of a portion of the land to an individual family, a step has been taken to encourage future privatization.
4. The most effective demonstration farm operations exist where the Israeli expert works hand in hand with a host country counterpart to develop and implement the program.
5. Progress on the Kunarli farm has been delayed for lack of an Israeli Expert, the death of the Kolkhoz Chairman (now replaced) and, more recently, by the failure of the Kolkhoz to provide funds for construction of a water basin. The demand made by the Kolkhoz ($120,000 for construction of the basin) was also, in the opinion of the evaluators, excessive and should be denied. Furthermore, the option exists for locating a new cooperator for this demonstration farm.
6. Personnel who manage and operate the farms visited by the evaluators are intelligent, well-educated, and have good theoretical knowledge of agriculture. From the production standpoint, they have the basic knowledge to do a good job. Most of the managers of dairy operations were veterinarians and agronomists and were equally well prepared for their roles. Lacking are management skills, established markets and marketing ability, and motivation for privatization.
7. State and collective farms have more people attached to them than are needed for profitable operation. Ways must be found to utilize this surplus labor force outside the farming operations.
8. Private farms (or government/collective farms trying to privatize) are having a struggle adjusting to a market system.
9. Farm managers and workers have an inadequate concept of

markets and how to use them. Assistance needs to be provided at the farm and community levels to teach needed skills. Such skills should be taught in connection with existing demonstration farms (Alma Ata Dairy or Akhmad Yasawi, for example).

10. Farm level management and entrepreneurship training is needed at the farm level. Such training could complement USAID's work at the macro-level. Working and coordinating closely with USAID Missions would ensure that policy issues were presented to participating governments with a united approach.
11. Some demonstration farms (Akhmad Yasawi and Alma Ata for example) are showing the effects of "high technology and improved management" on agriculture production. The irrigation farms are effective demonstration sites, although very capital intensive. The increases in yields are the result of both improved irrigation techniques and the knowledge and experience which the Israeli Expert brings to the scene. Duplication of irrigation farms in regions of plentiful water will be likely only for the production of high value crops. Sites in more arid regions, with problems of both quality and quantity of water, may be in order if future sites are selected (should be accompanied by marketing assistance).
12. Interesting partial privatization models were developing around some of the farm demonstration units such as the individual families being responsible for their own "sub-farms" within the Akhmad Yasawi project and the development of private herd ownership as satellites to the main Akurgan farm (in Uzbekistan).

SUMMARY RECOMMENDATIONS

1. The Kunarli farm site (Kazakhstan) should be reevaluated and other sites considered. Selection of a site where micro-irrigation can be demonstrated under conditions of stress (water shortage and/or quality problems) should be considered. An alternate approach, involving more farms with extension/demonstration activities, might be considered (possibly in cooperation with a Private Farmers' Organization).
2. Future activities should stress the development of rural enterprise and entrepreneurship. Successful current sites could be useful as centers to promulgate training in these areas (ranging from accounting to management).
3. New directions are in order for the Alga Farm (Kyrgyzstan). The scope of activity for the Expert should be directed to the vegetable production for the Korean farmers (assuming an agreement can be reached), and his activities would take on more of an extension role for the remaining year of the project. Area farms should be identified where he can concentrate on extension activities in the production of high value horticulture crops (private farmers preferred).

Farms should be selected with the input of Winrock, VOCA, USAID Mission, local Private Farmers' Organizations and other organizations). If an appropriate agreement with the MOA and Farm is not reached, consideration should be given to dropping the project site (minimize the losses and look for a new opportunity).

4. Long-term experts should not work in isolation. They should identify a counterpart/s and work within the system, even if this somewhat slows the program's progress.
5. As the projects approach termination date, plans for follow-on activities should be developed. In some cases, the farms will not be ready for termination at the end of three years (because of slow startup, equipment delays, and other factors), and additional time will be needed to meet programmed objectives. Some demonstration farms should be considered, along with other alternatives, for additional activity that will lead to more privatization and outreach activity. Future activity should keep in mind the development of micro-enterprises and marketing, along with production.
6. Delays in obtaining equipment for dairy installation were experienced because of "Buy America" procurement requirements. Equipment should be purchased from the best source so project progress isn't delayed. The programs were designed by Israeli technicians for small scale operations for which equipment is readily available in Israel. The system should either allow MASHAV to procure equipment from the "best source" or, in the case of required "Buy America components," allow for a rapid issue of a waiver for procurement from other sources. The Israeli's are willing to "Buy America" and should be encouraged to do so when such equipment is equal or better for the specific needs of the project. In summary, the procurement process should not impede the progress of the project.

3. DEMONSTRATION FARM SELECTION

According to information received, and based on our own observations, demonstration farm selection was made only from farms suggested by the Ministry of Agriculture. Some of the farms were not good choices and were suggested political reasons, rather than professional reasons. In Kyrgyzstan, for example, Ethnic Russians, Germans, and Koreans (possibly the best farmers) farm the land. At the time the Alga and Dostuk farms were selected, there were many members of German origin on the farms. Since then, almost all of them have left Kazakhstan for ethnic reasons, and the production of the farms has suffered. In the future, MASHAV should also contact USAID, Farmer-to-Farmer, European Union, Mercy Corp, Private Farmer Associations (and any other organization which has access to farmers in the countries involved) for input in locating private partners. Farms should be selected for professional reasons, and the choice should be

taken to the Ministry for approval (if blanket approval can't be obtained for CDP operations). Choosing from a broader number of selections would not eliminate the chance of a poor selection, but it would improve the odds. Conditions and contacts are much better now than they were in 1992; thus, better selections should be possible.

The Deputy Minister of Foreign Affairs (Kazakhstan) outlined the value of cooperation and made a case for spreading programs to other parts of the country (not concentrate in Almaty Oblast). Reasons were that Almaty had less need than some other oblasts, preference is shown to Almaty residents, and agriculture in some areas (such as Chymkent Oblast, Suzac Rayon)) is more parallel to Israel than the Almaty Oblast. The Team agrees that if staff can be recruited for outlying areas, placement of experts in other Oblasts would be desirable. The Israeli Ambassador to Kazakhstan took part in the meeting and stressed the need for programs to be offered further from the capital city. In previous conversations, the Ambassador had recommended a model farm for the ChymKent area and reaffirmed his commitment at this meeting.

All farms are located very close to the capital city because, in 1992, it was felt that the location of operations could be more easily supervised in this manner (and experts could be more easily recruited). Future operations could now be placed in more distant locations. In Kazakhstan, for example, the merits of "drip irrigation" could best be demonstrated on the more arid regions of the country (such as ChymKent).

SELECTION CONCLUSIONS

1. Since 1992 there has been considerable contact with CAR farms and farmers, thus making it easier to select farm cooperators. Selection of farms further from the major cities is now a possible alternative.
2. Implementation of Demonstration Farms has been difficult because of inadequate support, lack of inputs, and operational problems (such as theft, lack of timely labor, & lack of local funding for implementation).
3. Central Asian personnel who manage and operate the farms the evaluators visited are intelligent, well-educated, and have good theoretical knowledge of agriculture. From the production standpoint, they have the basic knowledge to do a good job. Most of the managers of dairy operations were veterinarians. Lacking are management skills, markets and marketing ability, and motivation for privatization.

SELECTION RECOMMENDATIONS

1. To strengthen private agriculture and private farmer organizations (such as AGRO, Dukan Ordu, and others), MASHAV should identify and intensify its work with such organizations. Guidance for identifying such organizations can be obtained through USAID Missions, Farmer-to-Farmer Implementors (Winrock & VOCA) and local and other sources experienced with such groups. Care should be taken in

selecting national groups and leadership with whom to work, as many such organizations could be "self-serving" rather than serving the people they are representing. Since it is desirable to work with "local leadership and communities," oblast and rayon organizations should be considered.

2. Assistance, whenever possible, should be provided to local and oblast administration officials (rather than to the Central Government). Both farmers and public officials should be included in the target audience, with priority being placed on those working on private or privatizing farms.
3. Future activities at each demonstration farm should stress the development of rural enterprise and entrepreneurship. Successful current sites could be useful as centers to promulgate training in these areas (ranging from accounting to management).
4. The process by which MASHAV selects demonstration farms should be revised. The process should select farms on the basis of their objective merits, not on the wishes of Ministries. Consultation with USAID and NGOs (Winrock, VOCA, TACIS Program, and Private Farmers' Organizations) should precede selection of farms. Sites should be chosen at locations other than close to the capital city, and with specific developmental criteria in mind (for example, an irrigation demonstration should support the production, processing, and marketing of the product).
5. MASHAV and its partners are designing and planning extension activities to serve private farms and private farmer associations (centered around existing demonstration farms). These activities should be implemented.
6. An alternate to "full-scale" model demonstration farms should be considered (to reduce risk of concentrating funds in a single project). The identification of good private farmers as sites for "demonstration activities" to support extension efforts should be examined. Such activity, around specific commodities, might provide a case for developing an industry around a crop (for example: teach farmers to grow tomatoes while developing a market and possibly establish a plant for producing tomato paste).

4. STATUS OF QUADRILATERAL PROGRAM

Little activity currently is taking place with the program. TICA is to present a plan in November, but for now only a concept of the program exists. USAID has no additional money for the program but will assist by supporting the creation of a "Peace Corps" operated Business Center. USAID also will utilize resources of the Farmer-to-Farmer Program (Winrock International) and possibly the Citizens Network Linkage Program, linking Farm Bureau Organizations from U.S. counties with a partner area in Uzbekistan. Turkey will contribute special expertise in crop

production techniques and technology, agricultural economics, and surface (open) irrigation.

The Agribusiness Center will serve as a focal point for up-to-date agricultural and professional information while providing information on appropriate technologies and market intelligence. The Center will also examine and initiate agribusiness development involving post-harvest processing and promoting "value added" components to primary production

The training component will consist of both on-the-job (informal) and formal training provided through the participating countries. Training is to take place in Turkey and Israel, and will include in-country training in Uzbekistan and Turkmenistan. Training will reflect the relevant advantages of each country, with topics matching the experience and expertise of each country. Consensus appears to be developing for initiation of the program with assistance of Peace corps volunteers in key areas. Concern exists as to whether model farms will become an end in themselves and not serve the broad expanse of geography represented in the countries; thus, the possibility of establishing demonstration sites on a number of farms has been suggested by some. Farms have been identified by some NGOs who favor this type of approach.

Two model demonstration farms would be located in the same region as the rural and agri-business centers to encourage entrepreneurship and the adaptation of innovative technologies. The proposed demonstration farm units, linked to rural and agribusiness centers, would be near Ashkabad in Turkmenistan and Tashkent in Uzbekistan. The program is to be planned and monitored by a three-person steering committee representing Turkey, the United States, and Israel. Appendix H contains the Memorandum of Understanding and operational information about the program.

CONCLUSIONS

1. Groundwork is in place for implementation of the Quadrilateral Program. Development of an agreed on "action plan", hasn't yet occurred.
2. The major U.S. components (in addition to the CDP) in the operation will be the Rural and Agribusiness Centers which will probably be handled by Peace Corps Volunteers with input of FTF Volunteers from Winrock, International (and possibly Citizens Network).
3. The input of Turkey in the operation is anticipated sometime this year.

RECOMMENDATIONS

1. Continue to develop an implementation plan which will meet the objectives of the program. Involve other cooperators, such as TACIS Program (European Union), if they wish to contribute to the success of the program.
2. Consider alternatives to the "Model Demonstration Farm Units" as planned and consider placing demonstration sites

on identified farms where extension activities can be centralized.

5. SHORT-TERM CONSULTANCIES

In each of the three countries visited, the CDP carries out several short-term activities each year. In 1994, the number of short-term consultancies in the CAR were as follows:

Country	Consultancy numbers
Georgia	6
Kazakhstan	9
Kyrgyzstan	2
Turkmenistan	6
Uzbekistan	9
Total	32

Short-term activities are designed to support on-going work. New activities, according to the reports, included bee-keeping, veterinary artificial insemination, grain storage, fruit tree cultivation, vineyard cultivation and others. In some instances, short-term consultants have provided guidance to the steering committee while providing input to in-country programs. A mechanization consultant was sent to solve a grain shatter problem associated with harvest of grain, and, equally successful, was a consultant to provide guidance on private grain storage. Experts in the field spoke favorably of the assistance provided by short-term consultants.

CONCLUSIONS

Short-term consultants play an important role in the CDP CAR/Georgia program. Their work has been timely and supportive of the long-term efforts in the CAR.

RECOMMENDATIONS

Continue to utilize short-term consultants, as in the past, when they can contribute to the overall program.

6. ACTIVITIES IN GEORGIA AND TAJIKISTAN

The team did not visit Georgia; however, some documents, including the Oct. 1994 report, recommend the establishment of a demonstration farm in Georgia. Two farms were recommended with preference given to the Tavtavi Farm, a central institution with research stations in other regions of Georgia. The presence of outlying stations enhances the multiplier effect, and, in addition, the Tavtavi farm includes various beneficial activities related to agribusiness. The evaluators feel the program is proceeding as planned and recommend continuation of the efforts now underway.

The Ambassador in Uzbekistan has been accredited to Tajikistan for some time but in general, activities are limited because of political and security problems. Until the situation

improves, long-term experts are not likely to be assigned. As short-term missions are needed, however, they will be considered, as will OTS courses. Citizens of the country have been taking part in courses in Israel (9 in the last year and one-half).

7. MASHAV/CDP ACTIVITIES WITHIN THE FRAMEWORK OF THE HOST EMBASSIES IN THE CAR

The yearly scope of MASHAV activities in the CAR/Georgia, on the average, includes 15 short-term consultancies, 8 long-term experts, 170 (150 CDP) participants in courses in-Israel, and some OTS courses (enrolling up to 30 students per course) each year.

Overseeing is performed by the existing diplomatic staff which includes the Ambassador, one or two junior Israeli diplomats, and local staff. The functions of the Embassy are numerous and diversified and include written and oral communications with MASHAV, CINADCO, AGRIDEV, and others in Israel. In addition, the Embassy communicates with the oblasts in which work is being done, government offices, other donor organizations (including USAID), Embassies, NGOs, and others. The embassy recommends candidates for in-Israel and OTS courses, while conducting follow-up activities including the organization of the "SHALOM CLUB." MASHAV activities account for one-third, or more, of Embassy activities, and experts assigned to the Embassy also perform de-facto functions requested by the Ambassador. The Ambassadors, in spite of the increased workload created by MASHAV activities, wanted to increase the amount of activity.

In the yearly work plan presented to the Ministry by CAR countries, Ambassadors referred to the MASHAV activities as having helped them reach the level of understanding and friendship which they enjoy in these countries. The ability to share Israel's achievements in development and technology was represented correctly by the diversity of activities of MASHAV.

MASHAV activities fulfill a variety of functions in establishing Israel's status in these countries by presenting a friendly and positive image with country authorities and the public with whom they have dealt. MASHAV activities, such as courses in Israel, create an active and direct interaction in various activities of the country. One Deputy Prime Minister interviewed had attended a CDP sponsored course in Israel. CDP activities of MASHAV are very important to the Israeli Embassies working in the CAR. The in-Israel courses will have a long-range effect as participants move into positions of higher authority and responsibility (both in private and public sectors). The presence of a strong MASHAV capability has enhanced the development of good relations enjoyed by Israel in these countries.

CONCLUSIONS

1. The CDP is an important component of Embassy operations in

the CAR/Georgia. Ambassadors stated an overwhelming desire to expand such activities to support their diplomatic work. MASHAV training (not part of the CDP), such as the training for Doctors and Nurses, has been appreciated by host country recipients.

RECOMMENDATIONS

1. Based on the high level of acceptance, training and technical assistance activities should remain a major component of the Israeli Embassy's work in the CAR/Georgia.

8. APPROPRIATENESS OF THE CDP CAR/GEORGIA PROGRAM AND PROJECTS

The rationale for establishing the program (visibility of Israeli Embassy and sharing of appropriate technology) has been a good choice as technology is being shared and good relations exist between Israel and countries of the CAR/Georgia. The projects established have provided strengthened identity for the Israeli position in these countries with good recognition of the U.S. role in making the MASHAV CDP possible. The technologies being demonstrated are being considered by the recipients involved, and, in several cases, the projects have increased the desire for privatization. Training programs have created a respect for the successful development of Israel and provided an example for the returned trainees.

Networking of activities within the CAR/Georgia is being done by MASHAV, thus spreading the results of the program to other audiences. Some demonstration farms have moved slowly because the host (Kolkhoz/government) fails to recognize the significance of the new technology and management, or is not able (or willing) to supply the necessary inputs for which it is responsible. In addition, there is some question regarding the level of technology for the areas involved. Water is used freely in the regions of the demonstration farms; thus, advantages of water conservation by micro-irrigation registered little impact on some people. The efforts with the vegetable crop/irrigation programs might have been more effective had appropriate and good technology been demonstrated using systems more accepted locally. Also, the high cost of purchase for the drip and pressure irrigation systems precludes purchase, at least in the near future.

There are areas of the CAR/Georgia with major water problems (availability and quality) that might be better sites for demonstrating micro-irrigation. Future site selection should consider these options as the need for profitable production of high value horticulture crops on some of these areas is a good possibility (also, it would demonstrate the technology on sites similar to those in Israel, where water use/quality is a problem). Future projects might identify sites where production could be achieved, and combine more quickly the processing and marketing components along with the production technology.

The evaluation team concludes that the CDP is successful in the CAR/Georgia and recommends continuation.

9. NETWORKING RELATIONSHIPS OF THE CDP CAR/GEORGIA ACTIVITIES

The CDP team networks effectively with other government programs and NGOs. They have had numerous interactions with the FTF Program (VOCA and Winrock International) which has provided mutually beneficial outcomes. VOCA has been placing volunteers throughout Kazakhstan and has been especially pleased with those volunteers placed in distant oblasts. VOCA specializes in helping the private agricultural sector evolve by providing volunteers (on request) who specialize in areas such as business planning, farm management, marketing, cooperative development and related areas. They have many private sector contacts throughout the country and are glad to share this information. VOCA and the MASHAV personnel have a good working relationship which should be nurtured for the mutual benefit of both programs.

Winrock International has active programs in the three countries visited, and their FTF Volunteers have collaborated with the CDP on numerous occasions. In Uzbekistan, a volunteer worked with the MASHAV Expert at Akhmad Yasawi to prepare a vegetable manual (see Appendix F; manual prepared in Russian, English version attached). This manual is being distributed widely and received praise from many sources, including the MOA. In Kazakhstan, a volunteer is scheduled to assist with a marketing study for the Alma Ata mini-dairy. Similar interchanges exist in Kyrgyzstan. Working relationships with the Winrock program are excellent in the countries visited, and the projects offer mutual support to each other. The FTF projects can be especially useful to the CDP in identifying potential sites for CDP work.

The Experts are networking quite effectively with a number of NGO and governmental sources. Most noteworthy is the collaboration with the TACIS Program of the European Union. Through this linkage (in Uzbekistan), a technical and financial evaluation was made of the systems being demonstrated (see Appendix E). The experts were willing and eager to share their findings with all those who wanted the information. Project experts were well liked by counterpart co-workers and were considered to be hard workers, well prepared for their jobs, and "effective development experts."

The government still largely controls the purchase of crops; thus, there will be limited privatization in agriculture (as long as markets are still largely controlled). The Central Asia/American Enterprise Fund offer a good choice for financing (has $30,000,000 for Uzbekistan). Their small loan package fits many small private organizations/farmers by providing loans of $5,000 to $50,000. Various levels of success are being achieved, and, according to the USAID representative in Uzbekistan, the country is making progress in meeting the standards imposed by

the International Monetary Fund.

The CDP contains some creative and innovative examples of concrete steps towards privatization. The two milking parlors (on private model farms) in Akurgan belong to individual farmers and, if successful, will serve as a model for additional private dairy operations. This operation, combining a private dairy farmer with a central service center (for inputs and marketing), has some components of the Israeli Moshav system. The continuous cultivation of the same land, year after year, can point to another emerging case of privatization.

The Ministry of Agriculture (Uzbekistan) wanted the evaluators to visit a successful Kolkhoz and recommended the Politotdel Kolkhoz. The Chairman of the Kolkhoz had taken a course in Israel. This Kolkhoz is making money, pays the highest salaries of any Kolkhoz in Uzbekistan, and has money to invest. The evaluators visited a successful greenhouse where cucumbers were being grown. The greenhouse area (covering 6 ha) has been in operation for 18 years, exports vegetables to Russia, and has been very successful. The manager was extremely competent and spoke English. Over 100 employees, mainly women, are employed year-around in the operation with some additional fill-in labor. Such sources of employment are a major need as agriculture becomes more efficient (thus releasing labor force for other employment). It appears many successful operations of this type exist in the countryside, and the Experts should network with such operations.

CONCLUSIONS

1. The Experts are networking with numerous organizations, both government and non-government, in the countries visited.
2. Effective examples of collaboration were observed in each country visited.

RECOMMENDATIONS

1. CDP Experts should continue to expand their "networks" of working partners and identify additional areas of collaboration.
2. When possible, access to training opportunities in Israel (and OTS Courses) should support activities of related organizations (such as TACIS, European Union) working in the CDP/Georgia.

10. CDP SUPPORT OF HOST COUNTRY OBJECTIVES, USAID BILATERAL OBJECTIVES, AND MASHAV OBJECTIVES

Host Country Objectives: Host country objectives are very broad; thus, CDP activities support the country in a number of ways with broadest coverage provided by the training courses. MOA officials are interested in improving production and struggling with approaches to improve the input and output strategies to support agriculture.

MASHAV Objectives: MASHAV wishes to share its expertise as appropriate and simultaneously strengthen the standing of Israel in the CAR/Georgia. This objective is being achieved successfully through the training, demonstration farms, and technical assistance activity. CDP activities strengthen the role of the Embassies which oversee the development work of Israel in these countries. All Israeli Embassies consistently give credit to USAID for their input and support of the CDP.

USAID bilateral Objectives: The bilateral objectives of USAID are met through some of the programming of training courses and through the demonstration farm programs, when privatization is a component of the program (such as in the Alma Ata Dairy Project). The Economic Specialists serving in the countries work with various segments of the government and are promoting privatization activities (work with private farmers' association, for example). Their work with Kolkhoz Economists is helping to make inroads into the system by acquainting each Kolkhoz with cost accounting based on true costs of inputs.

The two Expert Economists work with the demonstration farm economists to determine their financial standings. They also work with groups of small farmers under a small farmer organization component of the government(groups of farmers with other jobs and about one-half ha of land), helping them do income calculations. In addition, they work with the Agricultural Ministry with a Department providing assistance to private farms surrounding several demonstration farms (Akurgan and Akhmad Yasawi farms). They are considering offering an OTS course for this group.

CONCLUSIONS

Objectives of MASHAV and the host countries are being met by the CDP activities. Some bilateral objectives of USAID are met by trainees studying in Israel and through privatization success on the demonstration farms.

RECOMMENDATIONS

The program should continue to support and complement the objectives of the host country, MASHAV, and the USAID Mission.

11. PROJECT MANAGEMENT/ADMINISTRATION

The Israeli Embassy oversees the program in the host country. Major responsibility for the program is generally assigned to a junior staff member in the Embassy; however, direct involvement of the Ambassador occurs as well. When a junior staff member is transferred, there is sometimes a lapse of assistance for the program while the new member is learning the procedures (Embassy staff is very small); however, the evaluators felt the Embassy role to be effective and responsive.

In Israel, the three main partners of the program have a

"Steering Committee" which provides continual guidance to the program. The Steering committee consists of a member each from MASHAV, CINADCO, and AGRIDEV (the program manager) and meets every three weeks (more often if needed). The steering committee system is functioning quite well and appears to be meeting the operational needs of the program.

CONCLUSIONS

1. Program management is considered to be effective and meeting the needs of the program.
2. The management team is developing plans for follow-on activities for support and development of existing farms and farmer organizations. Future activities should keep privatization, business planning, microenterprise development, and marketing in mind.

RECOMMENDATIONS

Reporting prccedures and timing of the Experts in the field should be reconsidered and streamlined when possible. It is suggested that semi-annual and annual reports be prepared in Russian, Hebrew, and English so the value of the experiences can be widely shared. Distribution should include selected NGOs, USAID Missions, and USAID Washington.

IV. LESSONS LEARNED

Development work in the CAR/Georgia is a different experience from past work of MASHAV. In previous experience, experts generally worked within market economies and with countries of low average educational level. The CAR/Georgia has well-educated people with little concept of a free market economy. Counterparts have not been concerned with costs factors, only their particular role within the system. Many people are disgruntled with the change and would like to go back to the previous system which was, to them, more predictable and equitable. Farm workers are well-trained in agriculture and have good theoretical knowledge. Public officials need assistance in directing privatization efforts, and private businesses need direction in operating their farms according to market principles.

1. The identification of a "working counterpart" is vital for success in such operations.
2. Special care must be taken to select work demonstration farms in order to meet project work goals and to insure multiplication of efforts. Exclusive reliance on the government suggestions for identification of demonstration farm sites had limitations.
3. Programs that have a rapid economic response are very likely to succeed in the CAR. Future irrigation farm programs centered around the capital cities could be more expert intensive (emphasizing management) and less equipment intensive in some cases.

Appendix A: Scope of Work--Report Preparation (extracted from purchase order No. HNE 0185-0-0-00-5056-00)

C.3. SCOPE OF WORK--REPORT PREPARATION

The report is to be based on the contractor gathering and analyzing relevant project information in all its modalities and components in order to assess overall project performance, make suggestions for mid-term adjustments, if necessary, and recommend future course(s) of action:

a. Information (Data Collection):

(1) Review available documentation from USAID, MASHAV, and cooperating Israeli institutions (AGRIDEV, e.g.).
(2) Interview responsible staff in above entities involved in the CDP CAR/Georgia Program.
(3) Identify selected groups to be interviewed among trainees, sponsoring institutions, and authorities and TA experts.
(4) Select/Determine project sites in CAR/Georgia countries to be personally visited and assessed.

b. Information Analysis:

Among the issues the report should examine and assess are:

(1) The rationale for establishment of the CDP CAR/Georgia Program and projects.
(2) The identification of the development problems to be addressed through the project.
(3) The appropriateness of the CDP CAR/Georgia Program and projects as a means to address these problems.
(4) Relevance and utilization of results of demonstration farm activities by the farms in general.

c. Assessment/Evaluation of Performance:

The report should assess/evaluate at least the following:

(1) The CDP CAR/Georgia Program's general implementation vis-a-vis its purposes, special strengths and special weaknesses.
(2) The CDP CAR/Georgia Program's contributions to strengthening/expanding relations between Israel and the host countries.
(3) The degree to which the CDP CAR/Georgia Program's activities support the development objectives of the host countries, of USAID bilateral programs to each country, and of MASHAV.
(4) Estimate the impact of the various elements of the CDP CAR/Georgia Program, both qualitatively and, if possible, quantitatively. Assess the overall impact of

the CDP CAR/Georgia Program to date. Assess the sustainability of individual program projects and in general.

(5) Assess the appropriateness of individuals and organizations identified by the host countries for various roles in the various projects of the CDP CAR/Georgia Program with special attention on assignment of counterparts and future leaders and managers of the various in-country projects.

d. Detailed Assessment of Specific Components of the CDP CAR/Georgia Program:

The Report should provide detailed assessment of the following specific components of the CDP CAR/Georgia Program:

(1) Training:

Assess the procedure for the selection of candidates, contents of courses, presentation of courses, applicability of participants, both regarding courses in Israel and courses In-Country; assess the procedures for post-training assessment, and the views of participants about the relevance of the training after they have returned home.

(2) Long-term Experts and Short-term Consultancies

Assess the procedures for selection of consultants, definition of their duties, their guidance and monitoring, relations with various partners of the CDP, reporting procedures, and evaluation.

Assess the procedures for, and effectiveness of, the selection of subjects/topics to be addressed by the Israeli experts, as practiced by the authorities.

e. Findings and Recommendations:

(1) Presentation of Findings and Recommendations for changes, if necessary, in current activities, plans for future activities, and the direction of overall CDP CAR/Georgia Program

(2) Presentation of Lessons Learned from the CDP CAR/Georgia Program to date for developing other similar programs in the future.

f. Assistance in Preparation Conduct of the Assessment:

(1) USAID/Washington (G/HCD/PP), Edward Lijewski, will provide access to available background information on the CDP Program.

(2) MASHAV (contact is Mr. Shimeon Amir) will provide information support as requested to the Contractor, including access to all documents for the CDP CAR/Georgia Program regarding training and technical assistance provided.

(3) MASHAV's Evaluation Officer will be available to assist as appropriate and work with the Contractor during all stages of data gathering and site visits to take place in Israel and in the CAR/Georgia countries selected for visits.

(4) Contractor ground transportation in Israel and in CAR Georgia countries to be visited will be provided by MASHAV in conjunction with MASHAV's support for the travel of its Evaluation Officer.

g. Suggested Sequence of Field/Site visits.

MASHAV has proposed the following schedule as optimum and feasible for developing the Report:

1 Contractor arrives in Israel; joins with MASHAV Evaluation Officer in discussions over two days and then, together with CINADCO, AGRIDEV, and MASHAV staff, reviews pertinent documents

2. Contractor and MASHAV Evaluation Officer fly to Almaty

3. Briefi.. essions with MASHAV and USAID representatives

4. Ground transportation to Bishkek; review projects over three days

5. Ground transportation to Almaty; review projects over four days

6. Contractor and MASHAV Evaluation Officer fly to Tashkent; review projects over four days

7. Contractor and MASHAV Evaluation Officer fly to Jerusalem; over two days, an initial briefing of findings to CINADCO and MASHAV and visits to Israeli training institutes; contractor and MASHAV Evaluation Expert present/discuss draft report on assessment of CDP CAR/Georgia Program

8. Contractor presents draft report to USAID/Washington, G/HCD/PP, Edward Lijewski

9. Contractor presents final report to USAID/Washington, G/HCD/PP, Edward Lijewski

Notes: 1. The above itinerary includes visits to countries where CDP CAR/Georgia Demonstration Farms are in fact currently operational. All activities in other countries must be assessed in the report on the basis of written documents available from MASHAV/CINADCO/ AGRIDEV and interviews.

2. Site visits in the above countries should include visits to the demonstration farms and interviews with central and local authorities concerned with the

projects, associations of farmers, selected groups of ex-trainees, USAID and Israeli Embassies, relevant multilateral organizations (e.g., UNDP), and plans for the Quadrilateral Program in cooperation with TICA.

Appendix B. Travel Itinerary for Rodney J. Fink & Shimeon Amir

Aug. 14-18	Preparation for evaluation in Macomb, IL
Aug. 20	Depart Macomb, IL for Washington, D.C.
Aug. 21	Meet Ed Lijewski and others in USAID/State Department associated with the CDP program in CAR/Georgia. Depart for Israel
Aug. 22	Arrive Israel and met with Mr. Shimeon Amir of MASHAV. Meet Mr. David Mulenex, Science Attache in the American Embassy to Israel
Aug. 23	Meet Deputy Director General of the Ministry of Foreign Affairs, Mr. Chaim Divon, and other representatives of MASHAV CINADCO & AGRIDEV
Aug. 24	Depart for Tashkent, Uzbekistan. Spend night in Tashkent
Aug. 25	Travel to Ackmad Yasawi Kolkhoz to tour the demonstration farm and Kolkhoz, meet participants of MASHAV courses in Israel, and other citizens associated with the farm. Meet with Kolkhoz managers and Israeli Ambassador Goetz at Kokholz. Evening meeting with First Secretary Edie Shapira and experts Yigal Cohen and Sasson Shochat
Aug. 26	Prepare report in Tashkent (A.M.) and depart for Almaty, Kazakhstan at 6:00 P,M,
Aug. 27	Almaty Meeting with Israel experts, Baruch Bahir and Boris Moldawski
Aug. 28	Meeting with Director, Chief Agronomist and workers of Kunarly Farm; Meeting with President and Vice-President of the Almaty Medical College; Meeting with Kairat Ahakanov, United Nations National Project Coordinator; dinner in home of Ambassador with project members, Ministry Officials and others
Aug. 29	Meet with Ed Birgells of USAID Mission to Kazakhstan; Meet with participants of agriculture courses in Israel; meet with VOCA Vice Director and others of the Almaty VOCA office; meet with Deputy Minister of Foreign Affairs and members of the Ministry of Agriculture
Aug. 30	Visit to Alma Ata Dairy Farm near the town of Telgar. Conference with Director and others (including participants of courses in Israel), toured mini-dairy, retail outlet store, and dairy farm.
Aug. 31	Meet with Steve Reiquam, Winrock International Coordinator for Farmer to Farmer Program; interview students at Medical Center; and attend a reception for Israeli Foreign Minister, Shimeon Peres. P.M. Travel to Bishkek, Kyrgyzstan and meet with MASHAV Experts
Sep. 1	Meet with Deputy of the Prime Minister for Agricultural Affairs (Mr. Amanbaev) and with the Deputy of the Minister of Agriculture (Mr. Amarbaev Abdulmalik); meet with Fred Huston, USAID Bishkek and Mr. George Bergman

	of Winrock International (Farmer-to-Farmer Programmer); conference with members of the MASHAV Team
Sep. 2	Meet with Mr. Achmadov, Chairman of the Local Private Farmer's Organization, "Dukan Ordu"; tour Dostuk and Alga Farms; return to Almaty
Sep. 3	Travel from Almaty to Uzbekistan; meet with Winrock International Country Director (and Asst. Director)
Sep. 4	Fly to Urgench; observe agricultural activities and travel by car to Khiva; and return
Sep. 5	Visit mini-dairy demonstration farm at Akkurgan; meet with participants of MASHAV courses and citizens of the Kolkhoz. Evening, attend opening ceremony of the Uzbekistan "Shalom" club
Sep. 6	Meeting with participants of MASHAV courses from the Ministry of Agriculture; visit Politotdel Kolkhoz; meet with graduates of MASHAV graduates in Ministry of Health; meet with Deputy Ministry of Agriculture and Head of International Division of the Ministry; meet with Israel Embassy and MASHAV staff
Sep. 7	Depart for Israel; prepare report
Sep. 8-9	Israel, prepare report
Sep. 10	Report to MASHAV
Sep. 11	TelAviv for potential report to Am Embassy, work on evaluation report; depart for Moscow
Sep. 12	Moscow stop en-route to Washington, D.C.; (toured privatizing farms and businesses in Saratov Oblast)
Sep. 17	Depart for Washington, D.C.
Sep. 18	Report to USAID (Ed Lijewski)
Sep. 19	Return to Macomb, IL to complete report

Appendix C: Contacts Made by Evaluation Team

United States

1. Mr. Ed Lijewski, G/HCD/PP, USAID
2. Mr. Donald Mooers, U.S. State Department
3. Ms. Pat Matheson, USAID (phone interview)
4. Mr. Thomas Eighmy, USAID (phone interview)
5. Mr. Charles Uphouse, USAID (phone interview)
6. Mr. Marcus Winter, USAID (phone interview)
7. Mr. David O'Brien, AAAS Fellow assigned to USAID
8. Mr. David Mutenex, Science Attache in American Embassy to Israel
9. Mr. Larry Harms, Farmer-to-Farmer Program of USAID
10. Mr. Steve Gardner, ACDI in Washington, D.C. (phone interview)
11. Ms. Madonna Maguire, Farmer-to-Farmer Program (VOCA)
12. Mr. Steve Gardner, ACDI in Washington, D.C. (phone conversation)
13. Ms. Margie Ammons, Winrock International Institute for Agricultural Development, Morrilton, Arkansas
14. Mr. Chuck Rheingans, USAID (phone interview)

Israel

1. Mr. Shimeon Amir, MASHAV
2. Mr. Chaim Divon, Deputy Director of General Ministry of Foreign Affairs & Head of the Center for International Cooperation
3. Mr. Zvi Herman, Deputy Director of Center of International Agricultural Development & Cooperation (CINADCO)
4. Mr. Zeev Bogger, Director Development Company (Int.) Ltd.
5. Mr. Dan Ben-Eliezer, Director of Project Division of International Cooperation Center, Ministry of Foreign Affairs

Uzbekistan

1. Mr. Sasson Shochat, Economics and Marketing Expert of MASHAV in Tashkent
2. Mr. Yigal Cohen, Irrigation and Crops Expert and Coordinator of Achmad Yassawi Kolkhoz Farm Demonstration/Training Unit
3. Mr. Matania Ben Or, Dairy Expert and Coordinator of the Akkurgan Dairy Demonstration and Training Unit
4. Mr. Vladlen, Local Israeli Embassy assistant with CDP Programs in Uzbekistan
5. Mr. Edward Shapira, First Secretary of the Embassy of Israel to Uzbekistan
6. Mr. Abdul Almajid, Chairman of Achmad Yassavi Kolkhoz
7. Mr. Ardoriy Sultan, Vice-Chairman of Achmad Yassavi Kolkhoz
8. Mr. Ural Rakimozordiev, Chief Agronomist for Achmad Yassavi Kolkhoz
9. Ambassador Moshe Goetz, Ambassador of Israel to Uzbekistan
10. Michael Evnin, Country Director of Winrock and Assistant Country Director
11. Mr. Umat, Director of Society of Akkurgan (Cooperative Farm), 2 private farmers, and the manager of the mini-dairy

12. Mr. Matanya Ben-Or, MASHAV Expert to the Society of Akkurgan
13. Vladlen Melnik, Coordinator of MASHAV Center for International Cooperation, Ministry of Foreign Affairs
14. Dr. Gairat M. Bakirov, Chief of External Economic Relation Division, Ministry of Health
15. Khaldar I. Iskanov, First Deputy Minister, Ministry of Agriculture
16. Rakhim Kurbanov, Deputy Chief Foreign Economic Relations Department Ministry of Agriculture
17. Farkhod Ziyodullaevich Fuzailov, Manager of the Department of Medical Education and Staff, Ministry of Health
18. David H. Mandel, Country Representative to Uzbekistan, USAID
19. Deputy Chairman and Greenhouse Manager of the Politotdel Kolkhoz

Kazakhstan

1. Baruch Bahir, Economic and Marketing Advisor for MASHAV
2. Boris Moldawski, Irrigation and High Value Crop Expert for MASHAV
3. Eitan Eliraz, Vice President for MERHAV Group of Companies, Almati, Kazakhstan
4. Charm Blustein, Israeli Dairy Expert to Kazakhstan
5. Ambassador Benzion Carmel, Israeli Ambassador to Kazakhstan & Kyrgyzstan
6. Mr. Avi Choresh, Israeli Crops and Irrigation Expert to Kyrgyzstan
7. Mr. Efrain Staiborm, Israeli Dairy Expert to Kyrgyzstan
8. Mr. Kairat Zhakanov, National Project Coordinator of United Nations (UNDP) in Almaty, Kazakhstan
9. Dr. Ayapov Kalkaman, President of Almaty Medical College, Kazakhstan
10. Dr. Galina Sultanovna, Vice President of Almaty Medical College
11. Ismailov Vassip Esupovich, Agronomist of Kunardi Farm, Kazakhstan
12. Amakikoji Canblkyabi, Chairman of Kunardi Farm near Almaty, Kazakhstan
13. Mr. Ben Sternberg, Director of VOCA Program in Kazakhstan (Phone interview)
14. Mr. Ed Birgells, USAID Almaty
15. Anatoly Shukhovtsov, Deputy Minister of Agriculture
16. Iosif I. Simon, Deputy Head of the Administration of External Economic Relations, Ministry of Agriculture
17. Ministry of Agriculture officials responsible for Staff of Foreign Office, Manager of Animal Breeding (Anatoly Michalov), and Deputy Chief of Personnel Staff
18. Kulgarina Nuriya Narmanbekovna, Deputy Chairman of Leading Management of Staff and Consulting, Ministry of Agriculture
19. Radik Rakhimbekow and Natasha of the Almaty Office of Volunteers in Overseas Consulting Assistance (VOCA)
20. Anatoly Shukhovtsov, Deputy Minister of the Ministry of Foreign Affairs and the Assistant Deputy Minister

21. Mr. Anatoli Ivanovich, Farm Director of Alma Ata Farm
22. Management staff of Alma Ata Dairy farm and Production Production Factory (MASHAV COOPERATOR)
23. Interview with a graduate of the Israel Dairy Management Course
24 Nisan Khakshouri, Double Contact LTD. Kazakhstan Office
25. Steve Reiquam, Farmer-to-Farmer Program, Regional Director
26. Vladlen Melnik, Coordinator of "MASHAV", Embassy of Israel, Tashkent

Kyrgyzstan

1. Avi Horesh, Israeli Irrigation and Crops Expert
2. Efraim Stalborm, Israeli Dairy Expert
3. Mr. Amanbaev, Deputy of the Prime Minister for Agriculture in Kyrgyzstan
4. Anarbaev Abdulmalik, Deputy of the Minister of Agriculture
5. Mr. Achmadov, Chairman of the Local Private Farmers Organization "Dukan Ordu"
6. George Bergman, Farmer-to-Farmer programmer for Winrock, International
7. Fred Huston, Senior Privatization Specialist, USAID Mission to Bishkek
8. Samatbek Kerimkulov, Director/Manager of Dostuk Dairy Farm
9. Mr. Bolot, Farm Director of Alga Farm (Kolkhoz)
10. Managers of Units of Dostuk and Alga Farms

APPENDIX D. Significant Documents Reviewed

1. Memorandum of Understanding for the Quadrilateral Program including Turkey, Israel, U.S. and Turkmenistan and Uzbekistan
2. Action memorandum for Amendment #10 to the USAID-Israel Cooperative Development Program (Project #298-0185)
3. Summary report of the European Union TACIS Program on Mission to Israeli-U.S. projects (Akkurgan and Akhmad Yasawi Projects)
4. Vegetable Production Guide prepared in cooperation with Winrock International using input of the Ackmad Yasawi Kolkhoz
5. Report on the Alma Ata Dairy Farm, Sasson Shochat (Dec. 1994)
6. Profitability Analysis Establishment of a Family Farm Unit in Akurgan, Sasson Shochat (March, 1995)
7. Period report of Akhmad Yasawi and Akurgan for 1994, Sasson Shochat (March 1995)
8. Sep. 1993 Report for Akurgan Farm, M. Ben-Yaakov (Oct. 1993)
9. Periodic Reports 1, 3, & 4 of the Akhmad Yasawi Project, Yigal Cohen (Aug. 1993, Feb. 1994, & Jul. 1994)
10. July to Oct. 1994 Report for Akhmad Yasawi, Yigal Cohen (Nov. 1994)
11. Periodic Report of Dairy Demonstration Unit, Alm Ata Farm, by Chaiam Bluestein (Mar 1994)
12. Survey of the Citrus Industry of Georgia by Izhak Horesh (Nov. 1994)
13. Recommendations for the Establishment of a Demonstration Farm in Georgia by Y. Alon, O. Dafna, & Y. Zamsky (Oct. 1994)
14. Study of the Development Potential of Deciduous Fruit Tree Orchards, Tashkent Province, Uzbekistan by Zvi Barkai (Aug. 1994)
15. Survey of Vineyards in Kyrgyzstan by Raban Eyal (Aug. 1994)
16. Study of the Development Potential of Deciduous Fruit Tree Orchards in the Batken District of Kyrgyzstan by Zvi Barkai (Aug 1994)
17. Annual Report of the Dairy Demonstration Farm of Kolkhoz Dostuk Kyrgyzstan by Efraim Steinboim (Feb. 1995)

МЕЖГОСУДАРСТВЕННЫЙ СОВЕТ
ПО ПРОБЛЕМАМ БАССЕЙНА
АРАЛЬСКОГО МОРЯ
ИСПОЛНИТЕЛЬНЫЙ КОМИТЕТ

ЕВРОПЕЙСКИЙ СОЮЗ - ПРОГРАММА TACIS
УПРАВЛЕНИЕ ВОДНЫМИ РЕСУРСАМИ И
СЕЛЬСКОХОЗЯЙСТВЕННОЕ ПРОИЗВОДСТВО
В РЕСПУБЛИКАХ ЦЕНТРАЛЬНОЙ АЗИИ

INTERSTATE COUNCIL ON
THE PROBLEMS OF THE
ARAL SEA BASIN
EXECUTIVE COMMITTEE

EUROPEAN UNION - TACIS PROGRAMME
WATER RESOURCES MANAGEMENT AND
AGRICULTURAL PRODUCTION IN THE
CENTRAL ASIAN REPUBLICS
(WARMAP)

Office: 5A, A. Kodiri St
Tashkent, 700128
Uzbekistan
Tel 415830/415516
16 July 1995

US-Israeli Agricultural Project
Embassy of the Republic of Israel
Tashkent
Uzbekistan

Dear Sirs

On behalf of my colleagues who had the privilege to visit the two projects of your organisation, kindly arranged and guided by Mr Sasson Shochat, I should like to express our thanks.

The information received from your team, Mr Shochat, Mr Igal Cohen at the drip irrigated vegetable project, and Mr Matanya Ben-or of the dairy project, was so comprehensive that we have been able to make for our own benefit a technical and financial evaluation of the systems which you are demonstrating. Although both projects have experienced and are still facing some difficulties in the achievement both of their objectives and their potential, a sound foundation has clearly been laid by the team and they should be congratulated.

Please find enclosed a copy of these notes, which you may keep for your own reference should they be of any help to you and, should you so wish, send to your project sponsors. They may be used without acknowledgement as you wish but before use outside your organisation I should be grateful if you would check with me if they are to carry the endorsement of WARMAP.

Yours faithfully

Geoff Rothwell
Project Team Leader
WARMAP

REPORT ON MISSION TO ISRAELI-US PROJECTS, 24 AND 30 JUNE, 1995

Programme

The team on 24 June comprised David Barnes (agric economist), Nick Oxley (hydrologist) and Michael Armitage (agriculturalist). On 30 June Sergei Nerozin (agriculturalist, SANIRRI), Geoff Mays (irrigation engineer), Chris Knee (economist) and Michael Armitage were in the team. The visits were very kindly arranged by Mr Sasson Shochat (tel 575779/567823) agricultural economist in the Israeli US Project to Uzbekistan) who accompanied both teams. The drip irrigated vegetable project is located about 10 km beyond the Tashkent city boundary near Mamut and is managed by Mr Igal Cohen (tel 367114). The dairy project is about 70 km from Tashkent near Akkurgan and is managed by Mr Matanya Ben or (tel 560834). On return the team visited the commercial drip irrigated pilot project run by Mr Avner Rafaeli (tel 336519/339240) of Netafim (Israel) but financed by the Petihetka sovkhoz. Very useful information was obtained on all visits from highly competent and well informed managers.

Drip irrigated vegetables

The system

It consists of a long stilling-pond fed by unlined canal, with lateral concrete sump protected by wire screens of decreasing mesh. A 100kW Russian made 3-phase motor drives a local centrifugal pump (which is rapidly wearing due to sediment) working at 71m head and pumping 315 cu m/h. Non-return valves both sides of pump make it non priming (useful in view of constant interruption in power supply), and a pressure release valve discharges back into the canal.

Pump output is into two parallel cyclone separators which are manually flushed about every 5 days. From the cyclones onward the system is Israeli manufacture. Water from the cyclones passes through 5 sand filters in parallel which (currently) auto flush every 45 minutes for 60 seconds back into pond. From each of these the water passes through two parallel 120 mesh disc filters which back flush together with the sand filters. Four fertigation tanks are optionally in the system before delivery of water through a buried pipe system to the fields. Discharge from each 1000 litre fertigation tank is 200 l/h.

From both sides of laterals, drip lines extend 128m on the surface (max distance). Drippers, which are flush type to facilitate reeling-in, are 0.6m apart in line and discharge 2 l/h. Two drip lines supply 1.4m wide onion beds with 0.4m spacing between beds. Single lines at 1.8m supply tomatoes and cucumbers planted in close twinlines. Area of drip is 26ha with 16ha double lines for onion. Potatoes are irrigated by mini-sprinklers spaced 6.3 m in line and 7.5m between lines which discharge 160 l/h. Mini-sprinklers work at 25m head and drip at 18m head. Due to equipment limitations (as supplied) this pressure difference can only be achieved by varying the crop area supplied by one lateral. Area of mini-sprinkler is 10 ha.

The system is computer controlled throughout. The programme is manually over-ridden on the basis of tensiometer readings at 15cm in onions and potatoes and 45 cm in tomato. Irrigation is started at not more than 3 bar in onion and potato and 5.5 bar in tomato but thresholds are varied with growth stage.

The system for 36ha including pipe spoolers (in and out), spools, supervising technician, 5 percent of value in spares and USD30,000 for delivery was USD120,000 in 1994. Due to increase in PVC price, the lines now cost 20 percent more. Increase of 10ha to capacity of the system is planned for an extra USD12,000. With care it will last for 15 years.

Crops

Amofos (10:46:0) at 450 kg/ha is broadcast and incorporated by cultivation prior to sowing. No K has been available from the kolkhoz since 1993. Sodium nitrate (34 percent N) at 350 kg N/ha is applied through the system, but is varied by crop on the basis of meter analysis of soil water extracted from a ceramic sampler inserted in the rootzone. For field operations other than irrigation in this second season, beds have been allocated to individual families, resulting in a much improved level of care and attention.

Two onion varieties have been used, the local variety looking better than the variety imported from Israel. There has been no problem with *Peronospora* and the only damage has been from thrips. Bed spacing allows access by tractor for spraying. Sprayer is an Israeli-down blast boom sprayer, about 15m wide. On account of the low disease level, Mr Cohen feels mini-sprinklers rather than drip would be preferred on onions because herbicides mostly are only effective in moist soil and this is easier to achieve with sprinkler. Yield of 40t/ha is expected, an improvement on the previous season.

Ungraded seed potatoes were supplied by the kolkhoz and included Romano imported from Holland in the previous season. In 1994, recently arrived seed was not "adjusted" to the climate, shrivelled quickly and did not germinate well. Spacing is 0.75 x 0.2m, so seed rate is about 4t/ha. No virus has been recorded in the potatoes and despite the mini-sprinklers, neither *Alternaria* nor *Phytophthora* have been recorded. Gesaguard and Dual were applied this season and were largely effective in weed control. Yield is expected to be at least 30t/ha and will sell at soum7/kg.

Cucumbers are a compact variety from Israel and although disease- free, were quite badly chlorotic at the canal end of the field, believed to be due to secondary salinity from the high watertable. The symptoms also indicated deficiency of K. Spacing is 1.8m between rows and 7 plants per m is the ideal in row spacing but was not achieved due to inadequate rainfall after planting. Planting early under plastic would have been preferred but this year it was too late. A big improvement is required in care during harvesting in order not to damage plants and fruit. Some 40t/ha is expected, less than 1994.

Tomatoes are from open pollinated Israeli seed (M82/1,costing only USD20/kg) of high brix, plum type for manufacture rather than fresh market. Spacing is 1.8m between tramlines spaced about 0.3m and the maximum advised plant population is 45,000 per ha. No *Alternaria* was visible. It is a compact bush type with uniformity of ripening but picking is on 90 percent maturity. Fruit size is 60-80g and handles well. Yield is expected to be 120t/ha and soum1/kg is expected from the factory.

If onions an cucumbers could be planted ealier in March under plastic, it would be feasible to plant a second crop in the season. Likely crops are cabbage and carrots, but autumn price is not good. Mr Cohen is concerned about disease build up and nematodes which he knows are a problem in the area and therefore for these reasons is not keen on double cropping. Strawberry is a possible crop for the area but it requires much water in April before the canal opens, and the labour at present is too rough for such a delicate crop.

Water application and efficiency

Duties are 9-10 lcm/ha for onion, 5 for tomato, 6 for potato, 4 for cucumber, 4-5 for cabbage and 3 for carrot. Mostly 140 cu m per ha per day are applied with more or less depending on stage and crop. There is usually a 2-3 day interval between applications. Application efficiency is calculated for mid June and assumes soil to be a silt loam with AWC of 16 per cent. These

rates are for the replacement of losses due to evapotranspiration only and do not include water applied for soil preparation and germination.

Potato - From FAO model and Tashkent climate data, ETc is 6.4mm/day or 32mm in the 5 days of the irrigation cycle. With roots to 0.5m, total available moisture (TAM) is 80mm. Hence depletion of TAM is 32/80 or 40 percent, the maximum desirable for potato. Irrigation is for 3 days in 5 at 3h/day and 35 cu m/h/ha which is 315 cu m/ha in 3 days or 31.5mm. Irrigation efficiency therefore is 32/31.5 or 100 percent

Onion - From the FAO model and Tashkent climate data, ETc is 5.5mm/day or 27.5mm in the 5 days of the irrigation cycle. With roots to 0.3m, TAM is 48mm and depletion is 27.5/48 or 57 percent which is perhaps a little too much for this crop. Irrigation is 950mm over 150 days elapsed time or 90 days of application, 10.6mm daily or 31.7mm in 3 days. Application efficiency therefore is 27.5/31.7 or 87 percent

Tomato - ETc is 5.0mm/day or 25mm in the 5 day cycle. With roots to 0.5m, TAM is 80mm and depletion is 25/80 or 31 percent which is good for this crop. Irrigation is 600mm over 120 days elapsed time or 72 days of irrigation, 8.3mm/day or 25mm in 3 days. Application efficiency therefore is 25/25 or 100 percent

Cucumber - ETc is 4.5mm/day 22.5mm in the 5 day cycle. With roots to 0.8m, TAM is 128mm and depletion is 22.5/128 or 18 percent which is perhaps a little extravagent. Irrigation is 400mm over 90 days elapsed time or 54 days of irrigation, 7.4mm/day or 22.2mm in 3 days. Application efficiency therefore is 22.5/22.2 or 100 percent

These values are excellent and testimony to the very high level of management in this project. It is cause for regret that so far neither Government nor kolkhoz has provided high calibre counterparts for in service training to the high level required to be able to take over management on departure of Mr Cohen next year

Comments by Deputy Chairman of Kolkhoz

He is very happy with the drip system and is keen to expand the area and to other crops, including cotton. The perceived advantages are:

greater flexibility in crop rotation,

higher yields,

easier management of irrigation,

lower labour requirement, labour being scarceon kolkhoz,

vegetable quality is not less than traditional system,

crop duration is reduced,

higher price for potatoes as first on market in area.

Gross Margins

The project area was 36 ha in 1994 but is due to be extended in the future to 46ha, which would then be at the maximum capacity of the irrigation equipment. The cost of the irrigation equipment is $132,000 including delivery, spare parts, and installation. The depreciation and interest on capital for this outlay is estimated to be $293 per ha per year, assuming a 15 year lifetime. In theory, the Kolkhoz is responsible for providing all the other inputs for the project, but in practice, all the seed (except potato) and all the chemicals have been sourced in Israel. The Kolkhoz is responsible for all the field labour and machinery and controls the harvest. This has not been costed in the present analysis. After the first 3 years of Israeli management and training, the project will be handed over totally to local management.

The gross margins are based on the 1994 cropping season. They show excellent results in the range from $886 per ha in the case of cucumber to over $4200 per ha in the case of potato. There are, however, some aspects of yield levels that need to be explained. There were a lot of field losses that took place in the case of tomatoes and potatoes at harvest time. Pre harvest tests showed that there was a potential yield of tomatoes of 120 tonnes/ha and potatoes of 40 tonnes/ha. This year the problem has been largely fixed due to a new system of family responsibilities for separate areas of the crop. In the case of carrots, there was no harvest at all, even though there was a good crop. An estimated yeild and price was therefore used in the analysis. In the case of onions, the low yield has yet to be explained, but may be due to poor soil conditions in some areas of the field. Again, pre harvest tests revealed a potential yeild in some places of 60 tonnes/ha.

The next table shows the individual crop gross margins. The bottom line margin figure is not strictly a gross margin as some costs have been allocated that are not strictly variable costs. Particularly, the depreciation cost of the irrigation equipment and the share of the irrigators salary. Both of these items should be more correctly be allocated to overheads, but are included here in order to facilitate a comparison with the traditional flood system. It should be pointed out that although many of the costs bear reasonable parity with world market rates, the prices for water and electricity are very low in comparison. The average electricity usage under this system is approximately 3000Kwh per ha. At the locally charged price of 0.13 Soum/Kwh, this equates to a charge of $3.9/ha. At international rates, the level of energy use would cost in the region of $300 per ha.

Gross Margin analysis on Israeli drip irrigation project

Exchange rate at 1/1/95 25

		Tomato	Onion	Potato	Cucumber	Cabbage	Carrot	Total
Output								
ha		10	3	9.3	2.65	5.82	5	35 77
Total yield		558	49.1	276.9	66.6	238.2	250	
Yield per ha		55.8	16.4	29.8	25.1	40.9	50.0	
price per tonne		860	2900	4800	1800	1200	1500	
Output per ha Soum		47988	47463	142916	45238	49113	75000	
Output per ha US$		1920	1899	5717	1810	1965	3000	
Variable costs								
Seed	kg/ha	1	5	3500	3.2	0.67	2.5	
	soum/kg	500	400	4.9	800	5000	625	
Seed cost (S/ha)		500	2000	17150	2560	3350	1562.5	
Fertilizer								
Ammophos 10,46,0		2750	2750	2750	2750	2750	2750	
Nitrogen 34,0,0		4200	5000	4200	4600	4600	4600	
Sprays		6475	4625	4600	4625	6200	4625	
Total variable costs		13925	14375	28700	14535	16900	13538	
Gross Margin per ha		34063	33088	114216	30703	32213	61463	
Irrigation Costs								
Water used per ha		6000	10000	8000	6800	9200	9200	
Cost/ha @ 0.018 Soum/m3		108	180	144	122.4	165.6	165.6	
Total used on field		60000	30000	74400	18020	53544	46000	281964
Total Electricity used		23407	11704	29025	7030	20889	17946	110000
Cost per ha @ 0.13 S/KWh		304	507	406	345	467	467	
Laying and lifting lines								
Tractor hours per ha		6	7	7	6	7	7	
Cost @ 75 S/hr		450	525	525	450	525	525	
Man hours per ha		36	36	26	36	36	36	
Cost/ha @ 850 soums/month		162	162	117	162	162	162	
Depreciation and capital cost of equipment		7325	7325	7325	7325	7325	7325	
Share of irrigators salary		150	150	150	150	150	150	
Total allocated costs Soum/ha		22424	23224	37367	23089	25694	22332	
Total allocated costs US$/ha		897	929	1495	924	1028	893	
Net Margin (Soum/ha)		25564	24239	105549	22148	23419	52668	
Net Margin ($/ha)		1023	970	4222	886	937	2107	
Total Net Margin ($)		10225	2909	39264	2348	5452	10534	70732
Average net margin per ha ($)								1977

Similarly, the average level of water use is 7800cu. m per ha. At the local price of 0.018 Soum per cu. m, this is a charge of $6/ha or $0.72 per 1000 cu.m. It is likley that the actual cost of delivering the water to the farm gate is in the region of between $5 - $10 per 1000 cu. m (WARMAP S-P3a).

Comparison of water requirements

	Tomato	Onion	Potato	Cucumber	Cabbage	Carrot
Drip irrigation m^3/ha	6000	10000	8000	6800	9200	9200
Application efficiency	100	88	100	100	100	100
Flood irrigation						
Assuming 60% efficiency (m^3/ha)	10000	14667	13333	11333	15333	15333
Excess use over drip	4000	4667	5333	4533	6133	6133
Cost of excess water @0.018S (soum/ha)	72	84	96	82	110	110
Cost of excess water @$10/1000$m^3$ ($/ha)	40	47	53	45	61	61
Assuming 40 % efficiency (m^3/ha)	15000	25000	20000	17000	23000	23000
Excess use over drip	9000	15000	12000	10200	13800	13800
Cost of excess water @0.018S	162	270	216	184	248	248
Cost of excess water @$10/1000$m^3$	90	150	120	102	138	138

It can be seen that if the water is valued at $10 per 1000$m^3$ then there are savings to be made in the range from $90 to over $150 per ha by a change to the new system, assuming that the traditional flood system has field efficiency of only 40%. Because the field irrigation efficiencies have increased to nearly 100%, this will have a beneficial long term effect of reducing the salinity levels in general and also a lowering of the ground water table, although the effects will only be very localised as the scheme covers less than 50 ha.

The following table shows a comparison between the new gross margins received on the drip irrigation system with those of the traditional flood irrigation system. This has been calculated using the average yields obtained by the collhoz over the last 4 years, but using the same price and variable costs, in order to make a meaningful comparison of growing techniques.

The differing irrigation costs are then subtracted and it can then be seen that all of the net margins are less on the traditioanal system except for onions, which, as discussed above, may have had husbandry problems that may been cured during the current growing season. The break even yields are shown that need to be obtained in order to pay for the extra irrigation costs. In percentage terms, a yield increase of only 10% is all that is necessary. It would be difficult to say, however, that the very impressive yield increases seen in this project were entirely due to the change in irrigation techniques. The considerable knowledge and experience of the Israeli manager here must also be an important factor. However, it demonstrates the potential of the agricultural situation. For instance, in the case of tomatoes, a yield increase of nearly 100% has already been demonstrated, and it seems that a 400% increase is also possible.

Comparison of gross margins

	Tomato	Onion	Potato	Cucumber	Cabbage	Carrot
Drip irrigation						
Yield	55.8	16.4	29.8	25.1	40.9	50.0
Output	47988	47463	142916	45238	49113	75000
Variable costs	13925	14375	28700	14535	16900	13538
Irrigation costs	8499	8849	8667	8554	8794	8794
Net margin (soum)	25564	24239	105549	22148	23419	52668
Net margin ($)	1023	970	4222	886	937	2107
Furrow irrigation						
Yield	30	30	10	8	23	n/a
Output	25800	87000	48000	14400	27600	
Variable costs	13925	14375	28700	14535	16900	
Irrigation costs						
- labour	115	115	115	115	115	
- water @ 0.018S/m^3	270	450	360	306	414	
Net margin (Soum)	11490	72060	18825	556	10171	
Net margin ($)	460	2882	753	22	407	
b/e yield increase required to pay for extra irrigation costs (tonnes/ha)	9.4	2.9	1.7	4.5	6.9	
yeild increase as % of old yield	31%	10%	17%	56%	30%	

Cotton project

This page and the next one and one half pages summarize the stop made by the TACIS team after departing from the Vegetable farm (commercial drip irrigated pilot project).

The area covered at 90ha is somewhat larger but is a small part of a 30,000ha sovkhoz devoted mainly to cotton production.

The system

The system is much the same as described above except that the stilling pond is smaller and no screens protect the sump, there are no cyclones nor disc filters, and fertigation is achieved simply by tipping urea into the stilling pond. Two local 50hp motors supply water in parallel into a series of 10 sand filters. The distribution system is more complex with rotation between four blocks in each of three large fields. Filter flushing and irrigation are automatic and under computer control.

Drip lines are 200m each side of the buried distribution system. Drippers are flush-type to assist spooling, are spaced 0.9m in the line and discharge 1.6 l/h. Lines run in alternate interrows at 1.8m apart.

The crop

The manager arrived from Israel only after planting was complete. Due to dry conditions, the farm was requested to irrigate the project field by furrow to enhance germination but did not do so. Drip lines could not be laid until the third interrow cultivation was complete and soil water deficit stressed the crop. Since irrigation and higher temperatures, growth has been rapid with marked elongation of internodes and many dormant seeds have since germinated but too late to contribute to yield. Average crop height was about 0.65m and exceptionally uniform.

The variety S46 was planted by the Kolkhoz in late April after 500 kg/ha of Amofos (monoammonium phosphate) had been broadcast and incorporated. This applies 55 kg N/ha and 105 kg P/ha (238 kg P_2O_5/ha). The main farm crop receives a further 250 kg/ha of urea (115 kg N/ha) but double this amount is being applied by fertigation in the project area. As this is an exceptionally high rate of N, it must be assumed that the process of tipping urea into the stilling pond is rather inefficient. The crop did not appear over fertilised, but it is understood that the farm uses a machine to top the crop at 1.2m and even cuts laterals too (with much loss of bolls). Plant population is exceptionally high at about 100,000 per ha and is suited to

machine picking but may depress yield for hand picking. The manager's request to reduce population was unheeded

So far this season, only aphid has been a problem causing much distortion of the young leaves. With the rise in temperature the aphids disappeared and so far neither mites nor bollworm (*Heliothis armigera*) have yet appeared. Mite damage was the main problem last year against which several sprays were applied with limited success. The farm uses B52 from Germany to control bollworm when the level of damage becomes obvious. There is no routine scouting nor integrated pest management, but some *Trichogramma* are routinely released to control bollworm

Most farm crop is machine picked, but the drip area is hand picked on three occasions. This will contribute some of the superior yield, estimated last year to be about 5t/ha. The farm average is 2.6t/ha

Water supply and application efficiency

Four tensiometers are located in one field at different depths as a guide on soil water status. A class A evaporimeter pan is located in the field with only 1-2 m gap to the crop. Epan, maximum and minimum temperature are recorded daily. The current Eo averages about 9mm/day, and temperature 36 to 16 deg C

The pan factor in these circumstances would be 0.65, hence ETo would be 0.65 x 9 = 5.9mm/day. The crop coefficient Kc at present is about 0.9, hence ETc is 0.9 x 5.9 = 5.3mm/day: this is in perfect agreement with the FAO model for cotton using climate data for Tashkent, currently 5.2mm/day or 36.4mm/week

There are 6173 drippers per ha discharging 9877 l/h/ha. Currently, the irrigation cycle was said to be 17.5 h/week or 17.8 mm/week but a graph in the office showed the intended rate to be 23 mm/week. This is far short of the expected evapotranspiration and the crop is destined to be stressed

There is a marked ploughpan at 0.3/m and roots bend towards the drippers. The surface texture was estimated to be silty clay with AWC of 19 percent. TAM is 3/0 x 19 = 70mm so depletion in a week is 36.4/70 = 52 percent. This is a little less than might be recommended for cotton at this stage of bud formation and early flowering when excessive water can cause

shedding of squares. Indeed, the manager reports excessive shedding in the farm crop after furrow irrigation of land with an occluded ploughpan. The area in passing certainly appeared chlorotic. However, in the drip project the consequence of the apparent failure of the system to replace all the water extracted by the roots will be to compensate by reducing the TAM and increase the depletion.

By early August it is intended to apply 45.5 mm which is exactly the ETc for one week, so throughout this period the irrigation efficiency is 100 percent. By then the growth stage has moved into the period of main boll development when lower depletion is recommended. If the ploughpan is as serious a barrier as believed, then root development will be restricted, TAM will remain at 70mm and depletion will rise to 65 percent. This is rather too high and the manager is right in saying he hopes to switch to twice weekly irrigation.

Despite the difficulties voiced by the manager, the project clearly is proving successful in demonstrating the huge benefits of drip irrigation, with double yield and water duty at 4 tcm/ha less than half the rate currently used. With controlled price of cotton so low and no charge for water, it is impossible that drip irrigation could be financially viable. Were either or both of these restrictions to be lifted and the financial to approach the economic situation, then the conclusion would be radically different.

Ikuvgan

Dairy project

The sovkhoz has about 3500ha and supports 2500 families. It grows mostly cotton and now wheat, but has 500ha of lucerne and will replant 500ha of wheat land with silage maize. Previously grain maize was produced but that has now been replaced by wheat by Government order. The dairy is still using stocks of maize grain from 1994.

The project has built a milk processing factory on an existing sovkhoz dairy unit. The plant was imported from Israel and cost USD120,000 including installation and overseas training costs. The capacity of this plant is less than half the production of the dairy so the remainder is sold to a Government milk factory nearby. The plant pasturises all milk and then mostly skims it, producing butter from the cream and soft cheese from the skim. Whey is disposed of as effluent at present. The manager hopes soon to have a licence to produce yoghurt for sale in Tashkent which is considered much more profitable.

The project now is establishing two pilot model dairy farms of family size, each with 40 cows and 60 followers but only a small land area, sufficient only to hold the stock. Each will buy all feedstuffs from the sovkhoz but will have its own electric milking parlour with storage tank and cooler imported from Israel at an inclusive cost of USD45,000 each. Work is slow due to lack of local funds for building. It is expected that once established these model farms will far exceed the performance of the solkhoz dairy due mainly to adherence to the correct feed regime.

The sovkhoz dairy

The dairy unit was established a long time ago and the machine milking equipment of Soviet origin and buildings are now old and in poor condition. Animals are kept in outside pens with open shelter and flanked by perimeter feed troughs. There is no misting to cool animals during hot weather.

Stock - There are some 470 cows, 400 heifers and 100 heifer calves under 6 months and 400 uncastrated male animals of all ages being reared for beef. There are 5 breeding bulls for serving heifers, but all cows are given a.i. Semen is from imported Dutch pure Friesian bulls at the a.i. centre and progressive upgrading of local cows has created a herd with mainly Friesian characteristics.

Meat production - The bull calves are reared for meat and sold at 450kg liveweight mostly under 2 years of age. Assume sale of 160 bulls yearly at soum20-22/kg liveweight on the farm. Cows are sold for slaughter after 5 lactations, average age 8-9 years. Assume sale of 100 cows annually at liveweight price of soum15-16/kg.

Milk production - Calving interval is 13.5 to 14 months and due to low fertility lactations can reach 350 days for most cows and heifers. The best cows produce more than 25 l/day but the annual average is only 3022 l or 8.3 l/day. This gives average daily milk production of 3900 l throughout the year but at present it is 4500 l. Average yield has increased by about 10 to 13 percent yearly since the start of the project, and to increase it yet further it has been proposed to cull poor performers and reduce stock numbers but there is local resistance to doing this. The manager believes average daily production of 6000 l is achievable with stock selection down to say 400 cows and attention to the feed regime. This is equivalent to an herd average of 5475 l per cow per year which is modest by western standards. Milk is sold to the local factory at

soum5 per l but the internal transfer price to the project plant is suggested to be higher (to justify the plant).

Feeding - The attached table (file AKUGFEED) summarises the approximate feeding regime. Fodder and straw transfer prices from field to livestock are arbitrary and together with wages for casual labour have been adjusted to give an enterprise gross margin close to zero, the likely current situation. The intended concentrate supplement for milk production is 2-3kg/day for less than 8 l/day, 5kg/day for 9-13 l/day and 7kg/day for more than 13 l/day. Concentrate is milled on the farm and on average consists of 40 percent maize grain (soum1/kg), 35 percent wheat bran (soum2/kg) and 25 percent cotton seedcake (soum1.5/kg). There are no supplementary minerals or vitamins as these are not available.

"Theft" of feedstuffs by the operators of the solkhoz dairy in order to feed their own animals at home, is seriously detracting from the performance of the dairy. The loss is from the troughs rather than the stores so the plane of nutrition of the cows is less than intended. A new enclosed feedstuffs mixing and weighing area and store is currently under construction which it is hoped will reduce the loss at least of concentrates. The attached summary table has been adjusted for up to 25 percent less feedstuffs than intended.

The roughages are not good quality as the lucerne has a high weed content and the silage maize is both too mature and has had many of the cobs removed.

Veterinery - Due to shortage of veterinery materials and their poor quality, expenditure is believed to be less than soum300 per animal per year. Mortality rate in calves is about 15 percent but after 6 months it falls to about 3 percent pa.

Labour - Casual labour is said to be 80 to 90. Three managers are assumed.

Buildings and equipment - Time did not allow detailed inspection. They are mostly in a poor state of repair and are regarded as a "sunk" cost in the financial analysis. For the future scenario replacement of both buildings and equipment is assumed.

Financial analysis - The table attached (file AKUGLSGM prs) summarises the approximate financial gross margin and enterprise profit based on the data as given. The gross margin is just positive on account of adjustment of the transfer price of fodders from field to dairy. It seems

unlikely that the dairy at present is contributing to the profits of the sovkhoz or indeed making financial provision for the replacement of buildings and equipment.

A future scenario is given in the table (file: AKUGLSGM.fut) where improved feeding and veterinery regimes and stock selection raise productivity of both meat and milk. The cost of feeding is increased by 50 percent to reflect better control of rates. It is assumed that the project obtains its licence to sell yoghurt in Tashkent so the transfer price of milk is increased to soum10 per litre. Despite the inclusion of higher fixed costs including higher salaries, the enterprise becomes profitable and the return on working capital at 54 percent is very attractive

The enterprise imputed gross margin of soum18,490 (USD 616) per ha of land for forage crops is very competitive and makes the system a viable alternative to cash crops. This is an important conclusion in the context of privatised farms replacing crops with low or negative gross margin, or crops with very high water-demand, such as rice. However, it could only be achieved with a wholly new and improved approach to the management of livestock.

FEEDSTUFF REQUIREMENT AND ITS COST: AKKURGAN SOLKHOZ, TASHKENT

File: AKUGFEED Date: 1 July 1995

Type of feed	Age of female stock (years)					Age of male stock (years)				Total
	> 3 milk'g	> 3 dry	1-3	0.5-1	0-0.5	> 3	1-3	0.5-1	0-0.5	
No. of head	403	67	320	80	90	0	230	80	90	1,360
Daily rate per head (kg):										
Milk	0	0	0	0	2	0	0	0	2	-
Concentrate	4	2	2	1	.5	0	2.5	1	.5	-
Summer:										
green lucerne	50	50	40	15	10	0	40	15	10	-
Winter:										
lucerne hay	6	6	5	4	3	0	5	4	3	-
maize silage	12	12	9	6	3	0	9	6	3	-
wheat straw	2	2	2	1	1	0	10	5	3	-
Daily requirement for herd (kg):										
Milk	0	0	0	0	180	0	0	0	180	360
Concentrate	1,612	134	640	80	45	0	575	80	45	3,211
Summer:										
green lucerne	20,150	3,350	12,800	1,200	900	0	9,200	1,200	900	49,700
Winter:										
lucerne hay	2,418	402	1,600	320	270	0	1,150	320	270	6,750
maize silage	4,836	804	2,880	480	270	0	2,070	480	270	12,090
wheat straw	806	134	640	80	90	0	2,300	400	270	4,720

SUMMARY

Total annual requirement (assuming winter 165 days, summer 200 days):

	Qty (t)	Yield (t/ha)	Land (ha)	Price (cym/kg)	Comment	Cost (cym pa)
Milk	131	-	-	5.0	factory price	657,000
Concentrate	1,172	-	-	2.0	sovkhoz price	2,344,030
Summer:						
green lucerne	9,940	40	249	.4	transfer price	3,976,000
Winter:						
lucerne hay	1,114	8	139	1.5	transfer price	1,670,625
maize silage	1,995	30	66	.5	transfer price	997,425
wheat straw	770	3	260	1	transfer price	77,000
Total forage		-	454			9,046,080

Note: rates have been adjusted for up to 25 percent "shrink" of intended rates.

PROFITABILITY OF LIVESTOCK ENTERPRISE ON DATA AS GIVEN: AKKURGAN FARM, TASHKENT

File: AKUGLSGM.prs Date: 1 July 1995

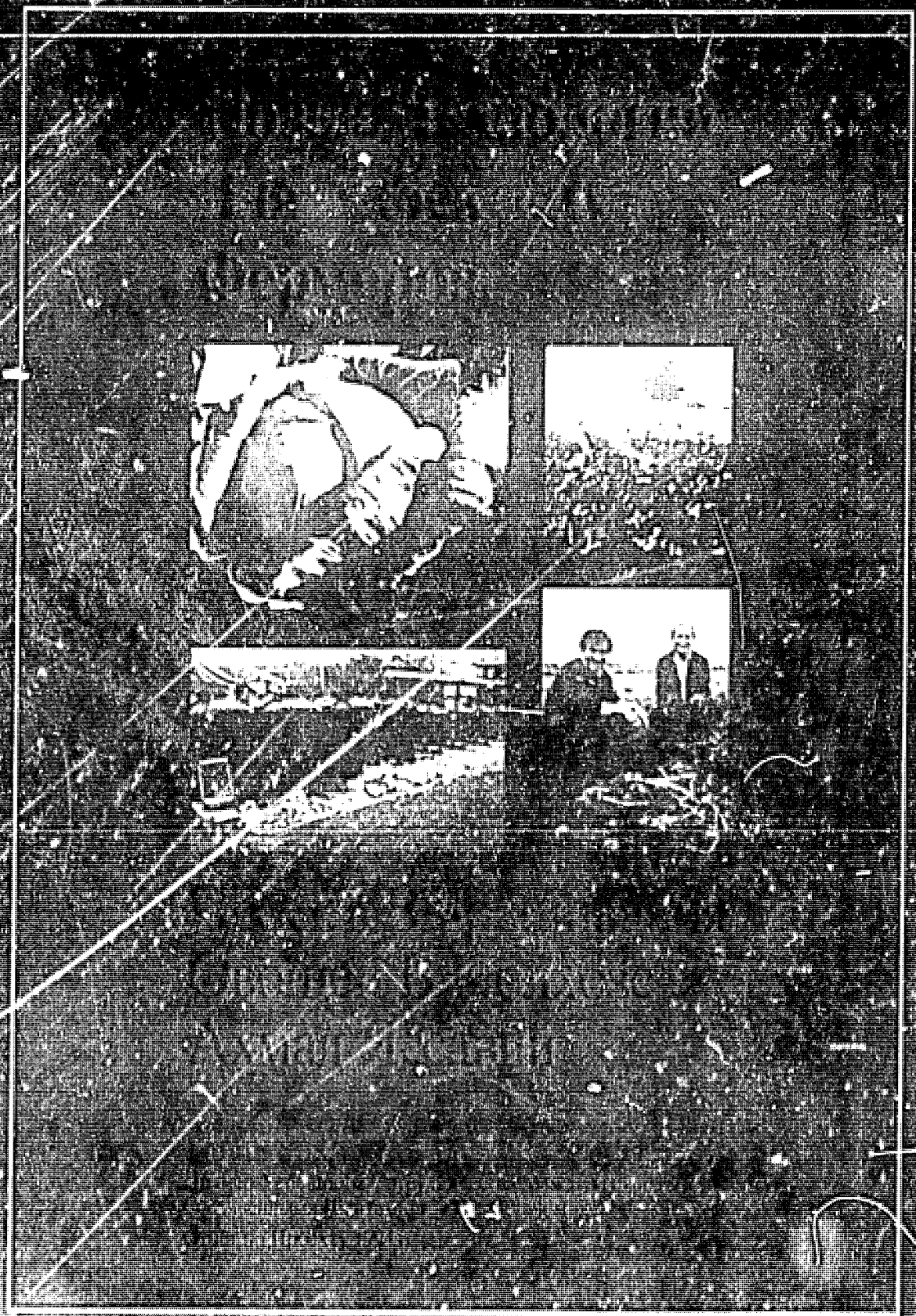
	No./yr	Unit rate	Units	Qty/yr	Av Price (cym/unit)	Value/cost (cym/yr)
GROSS OUTPUT						
Live animals:						
cows	100	400	kg	40,000	15.00	600,000
bulls	160	450	kg	72,000	21.00	1,512,000
Milk:	365	3,901	l	1,423,865	5.00	7,119,325
Manure	365	13	t	4,684	600.00	2,292,200
Total gross output						11,523,525
VARIABLE COSTS						
Feedstuffs (see table)						9,645,000
Veterinery	12	1	visit	12	25,000.00	300,000
Casual labour	85	12	months	1,020	850.00	867,000
Int on capital	1,670	2,829	head	4,440,857	.16	666,129
Total variable costs						11,478,129
GROSS MARGIN						45,396
FIXED COSTS						
Interest on capital						
buildings	0	200	sq m	0	.15	0
Depreciation						
buildings	10,000	200	sq m	2,000,000	.05	100,000
equipment	1	1,000,000	ls	1,000,000	.05	50,000
Salaries						
management	3	12	months	36	2,000.00	72,000
Total fixed costs						222,000
PROFIT						-176,604
PERCENT RETURN ON WORKING CAPITAL						-2
Required area of forage crops to support livestock enterprise						838
ENTERPRISE GROSS MARGIN PER HA OF LAND FOR FORAGE CROPS						85

FUTURE PROFITABILITY OF LIVESTOCK ENTERPRISE: AKKURGAN FARM, TASHKENT

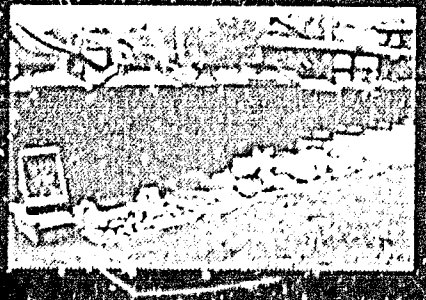
File: AKUGLSGM fut Date: 13 July 1995

	No./yr	Unit rate	Units	Qty/yr	Av Price (cym/unit)	Value/cost (cym/yr)
GROSS OUTPUT						
Live animals:						
cows	120	400	kg	48,000	15.00	720,000
bulls	180	450	kg	81,000	21.00	1,701,000
Milk:	365	6,000	l	2,190,000	10.00	21,900,000
Manure	365	13	t	4,684	500.00	2,292,200
Total gross output						26,613,200
VARIABLE COSTS						
Feedstuffs (50 percent more than table)						14,467,500
Veterinery	12	1	visit	12	50,000.00	600,000
Casual labour	85	12	months	1,020	1,000.00	1,020,000
Int on capital	1,500	2,815	head	4,222,674	.15	633,401
Total variable costs						16,720,901
GROSS MARGIN						9,892,299
FIXED COSTS						
Interest on capital						
buildings	10,000	200	sq m	2,000,000	.15	300,000
equipment	1	1,000,000	ls	1,000,000	.15	150,000
Depreciation						
buildings	10,000	200	sq m	2,000,000	.05	100,000
equipment	1	1,000,000	ls	1,000,000	.05	50,000
Salaries						
management	3	12	months	36	5,000.00	180,000
Total fixed costs						780,000
PROFIT						9,112,299
PERCENT RETURN ON WORKING CAPITAL						64
Required area of forage crops to support livestock enterprise						835
ENTERPRISE GROSS MARGIN PER HA OF LAND FOR FORAGE CROPS						10,490

APPENDIX 1 : Vegetable Production Manual Prepared by MIRROCK Farmer to Farmer Program Volunteer based on Oklunad Varsum work; document prepared in Russian, English version is attached (Russian Cover)



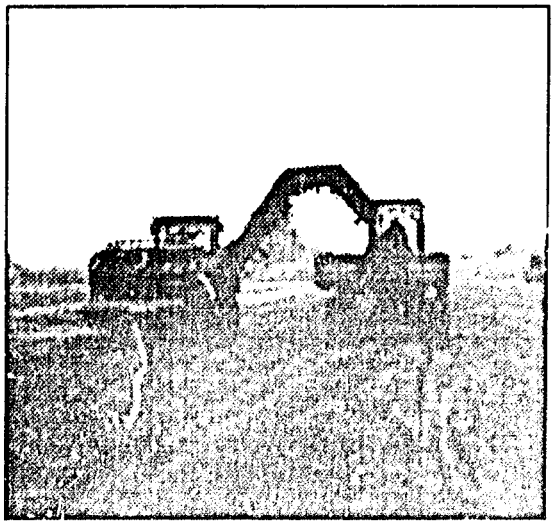
Putting Technology To Work For Uzbekistan Farmers

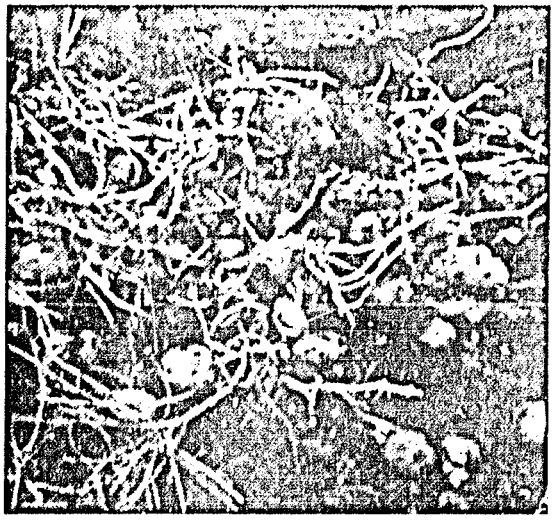


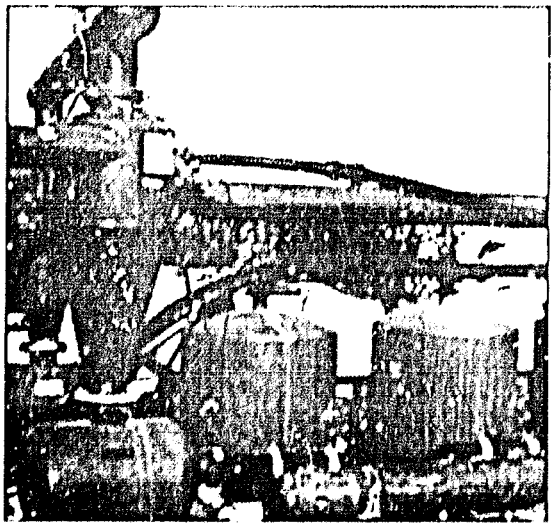
Akhmad Yasawi Collective Farm Vegetable Project

A Successful Collaboration Between Israel, the United States, and Uzbekistan

Project Report 1994







Established in 1960, the State of Israel Ministry of Foreign Affairs Center for International Cooperation (MASHAV) has worked around the world to provide assistance in agriculture and rural society, education, social development, and health. In addition to on-site projects in Africa, Asia, Latin America, the Caribbean, Central and Eastern Europe, work also has spread to Kazakhstan, Kyrghystan, and Uzbekistan in Central Asia. In-country training programs are held at MASHAV-affiliated centers and institutions and offer advanced study to more than 2,500 participants each year.

USAID

The United States Agency for International Development (USAID) has a long history dating back to 1947. Since that time, it has grown to include a broad spectrum of international assistance programs focusing on sustainable development, private enterprise, social welfare, health and family planning, women's issues in development, and transitional programs for assisted countries in developing democratic systems and market economies. Programs operate in more than 60 countries. In Uzbekistan, USAID conducts projects in economic restructuring, health and child-spacing, non-governmental organization development, energy and the environment, democratic initiatives, and provides assistance to private farmers, entrepreneurs, and agribusinesses.

The Ministry of Agriculture
Republic of Uzbekistan

Akhmad Yasawi Collective Farm Vegetable Project

In 1993, the Akhmad Yasawi Collective Farm Vegetable Project was launched to demonstrate vegetable production and micro-irrigation technology. As the first year concludes in 1994, vegetable yields prove that significant gains can be achieved through crop management and highly-effective drip and sprinkler irrigation.

"I'm very satisfied," noted farm Chairman A. G. Mashakhapov. "In the first year we've spent less on water and the harvest is greater. In fact, the tomato harvest was so good we couldn't keep up picking by hand," he said.

"We will analyze the results at the end of the year and make decisions about what to grow next year. Technology and information shared through the project has been of benefit to all our crops. I'm grateful to Israel, the United States, and the government of Uzbekistan for working together to make it happen," he concluded.

The Akhmad Yasawi Collective Farm, about 35 km south of Tashkent, is a leading producer of cotton, wheat, feed crops, vegetables, and milk. More than half of its 6,000 hectares are irrigated. Some 7,500 residents make their homes in seven settlements within the farm's boundaries; one fifth of them are farm workers.

In 1992, Israel and the United States, met with government leaders from the Commonwealth of Independent States (CIS) to begin a collaborative effort to increase agricultural production across the region and provide assistance to countries moving toward a market driven economy. A joint project between the Ministry of Foreign Affairs Center for International Cooperation of Israel (MASHAV), the United States Agency for International Development (USAID), and the Republic of Uzbekistan's Ministry of Agriculture was formed.

In the same year, a team of agriculturists from Israel and the United States visited Kazakhstan, the Kyrghyz Tan, and Uzbekistan to locate sites where production assistance could benefit the advanced stages of privatization on collective farms. Assistance in vegetable production and dairy operation was determined to be of critical importance. Two Israeli experts oversee three year model projects developed to address those needs at the Akhmad Yasawi and Ackurgan Collective Farms.

Since that time, an agricultural economist and marketing expert from Israel also has come to Uzbekistan to provide assistance at project sites and work with the Ministry of Agriculture. The three experts are employed by AGRIDEV, Agricultural Development Co (International), an Israeli government owned company assigned by the International Cooperation Centre (MASHAV) to implement this project.

The Akhmad Yasawi Collective Farm was selected as a location that could implement the Vegetable Project immediately and serve as a training center and demonstration site for the region.

As harvesting concludes in 1994, crop reports are being prepared and plans made for the spring 1995 planting season. This report of the project's work with vegetable production techniques and an overview of the irrigation system was prepared with the assistance of the Farmer-to-Farmer Program funded by USAID and operated by the U.S.-based nonprofit organization Winrock International. This material is available free of charge to Uzbekistan farmers and others to share the information gained and technology used in the project.

Akhmad Yasawi Collective Farm Vegetable Project

In 1993, Israeli Project Director Igal Cohen met with farm leaders to review the field site and determine what crops already in production should be included in the project. A 35 hectare site was selected and a specialized irrigation system using drip tubing and sprinklers was designed and installed.

During spring 1994 the irrigation system was installed and planting began immediately. A hothouse was built for raising tomatoes (.05 hectare) and a 1.5 hectare plot was prepared for raising cabbage.

New varieties as well as traditional vegetables were planted:

- Cabbage (6 Hectares)
- Onion (.9 Hectares)
- Carrots (4.93 Hectares)
- Potatoes (9.3 Hectares)
- Cucumbers (2.65 Hectares)
- Tomatoes (10 Hectares)

Privatization

To give local farmers firsthand experience in private enterprise, Cohen will divide the project field to private plots in the coming year. The farm will provide seeds, fertilizers and equipment. Individual farmers will be responsible for producing crops. A portion of their yield will be returned to the farm as payment for basic inputs.

Training is Vital to Improving Agricultural Productivity

Building human resources is a critical component of agricultural development. The Israeli/U.S. joint project provides both short- and long-term training to Uzbeki agriculturists in their home country and in Israel.

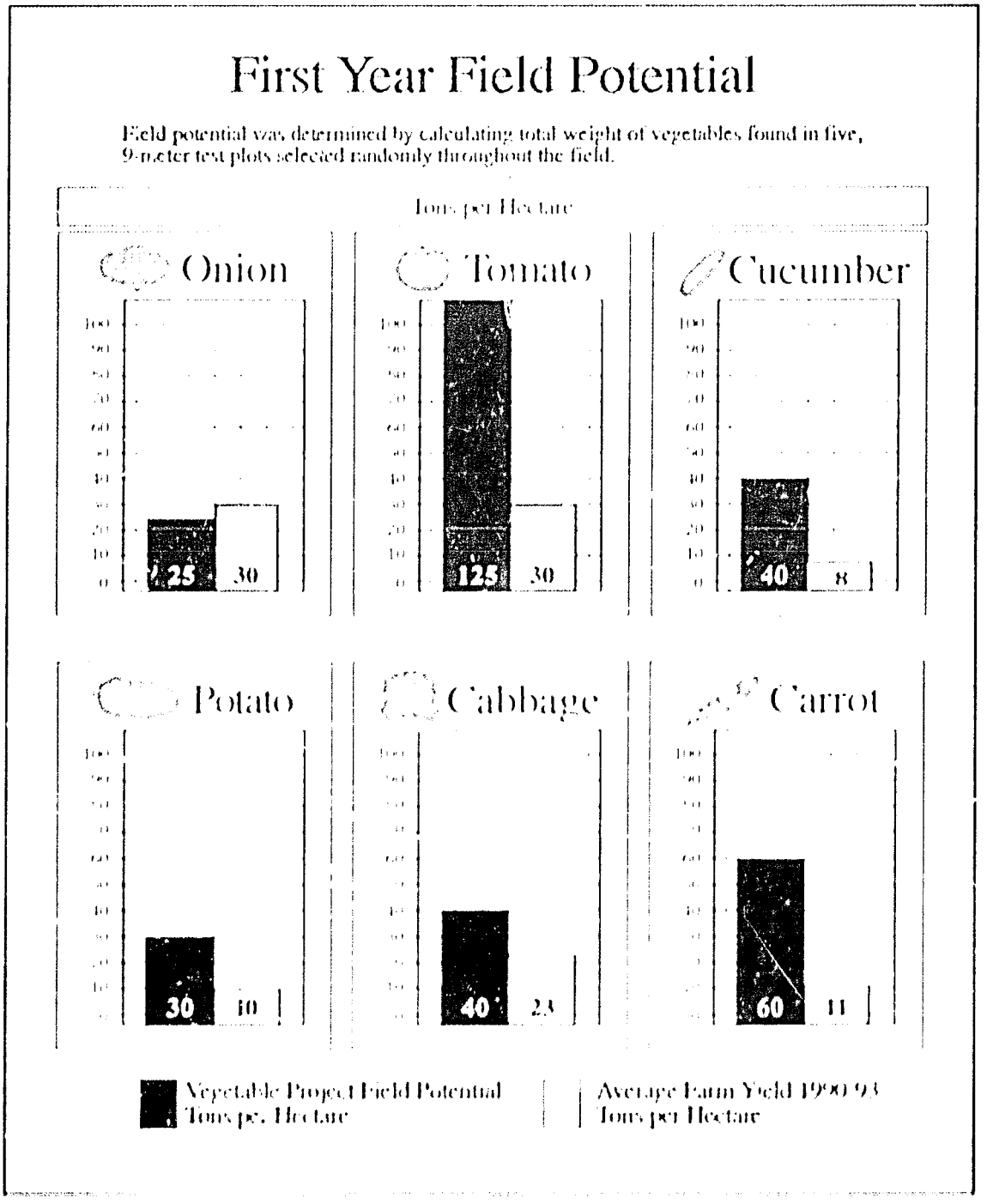
Courses in irrigation, agricultural development and management, vegetable production, and economics, management, and technology of dairy production are offered to qualified participants who study free of charge in Israel. The courses provide an in-depth look at these aspects of agricultural production and are offered in Russian. Courses in agriculture and a variety of other topics are available in English.

Israeli experts and advisers have traveled to Uzbekistan to work directly with local farm and ministry leaders providing intensive one week sessions on machinery maintenance and operation, honey production, grain storage, orchard management, grape and wine production, and veterinary medicine. These week long courses will be continued throughout the project.

In 1995, a series of courses will be added to the training schedule. Designed to meet the needs of Uzbek farmers, they will be held throughout the country for as many as 40 participants each.

Vegetable Project Brings an Improved Harvest

Although full reports on the first year harvest in 1994 had not been compiled at the time of writing, preliminary figures show a significant yield gain. For the potato crop alone, production improved by over 300 percent – 32 tons per hectare up from 10 tons per hectare previously produced on the farm.



Good Field Preparation is Essential

One of the most important ways to ensure a healthy crop and realize a good yield is to take every step necessary in preparing the soil to achieve even consistency and high nutrient value. Basic field preparation using Israeli machinery at the Akhmad Yasawi Vegetable Project is described below.

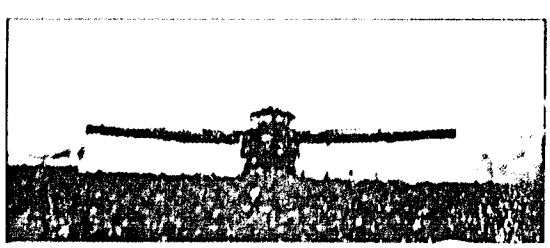
☒ 1. The field was plowed to break the ground, aerate the soil, and control weeds following harvest. Plowing the field during the summer is an effective way to control weeds and grasses that have complex and deep root systems.

☒ 2. When plowing was complete, the field was flattened with a **leveler**.

☒ 3. A **disc** was used to break up dirt clods, further aerate the soil to a depth of 15 to 20 cm, and reduce weeds that germinated during the winter.

☒ 4. The field was marked with a **ridger** to define each bed.

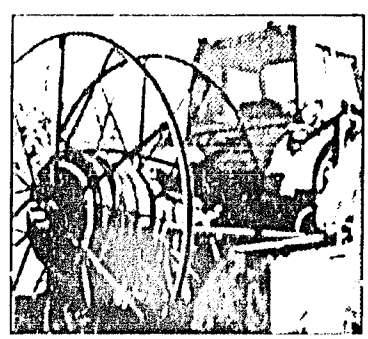
☒ 5. Fertilizers and herbicides were applied once the beds were marked.



☒ 6. A **sleeve boom sprayer** was used to apply weed, pest, and disease control chemicals prior to and following planting. The sprayer attaches to the rear of the tractor and is operated hydraulically from the cab. A 600 liter tank holds chemicals which are mixed and pumped to the boom arms. Plastic sleeves deliver constant air pressure from above the sprayers to ensure better crop penetration.

☒ 7. A **rotovator** was used to turn the soil for an even consistency, fully incorporate fertilizers and herbicides when needed, and shape each bed. The **rotovator** has 40 blades that mix the soil and shape a 180 cm-wide planting area. A smaller boom spraying device also can be attached to apply both liquid and powdered herbicides.

☒ 8. A **roller** was used to compact the soil and prepare the surface of the bed for direct sowing.



☒ 9. Drip or sprinkler lines were placed in each bed following sowing or prior to transplanting. A **distributor** attached to the rear of the tractor was used to release drip lines from large spools and retract them before harvesting. Each spool can hold approximately 3 km of irrigation line.

☒ 10. A **sowing machine** was used to automatically plant seeds. It can be adjusted to planting depths of 1 cm to 3 cm and for variations in seed quantity. Compared with traditional hand sowing, machine sowing can dramatically reduce the volume of seed needed for planting, is more effective, and reduces waste.

Micro-Irrigation Offers Important Advantages for Today's Farmers

Micro-irrigation is a highly effective technology that brings water directly to a plant's root structure through a low-pressure system of drip lines or mini-sprinklers. Irrigation occurs frequently over a long period of time. As a result there are a number of significant advantages to raising crops using this method of irrigation. A brief review of advantages and disadvantages of micro-irrigation follows.

ADVANTAGES

Increased Vegetable Production

Micro-irrigation allows the farmer to adjust the quantity of water uniformly across the field based on the exact needs of each crop throughout the growing season. An even, consistent application of water results in better, more uniform fruit because each plant is given exactly the amount of water and nutrients it needs for optimum growth.

Because fertilizers can be applied through the irrigation system, they are absorbed more quickly and efficiently by the plant. Additionally, the rate of application can be controlled and adjusted easily. Frequent irrigation reduces build up of salts around the root system and reduces stress on plants because the soil is not allowed to dry out between watering. Reduced stress and a better growing environment result in even plant growth and ripening. Fruit losses due to water damage are reduced. In many cases, diseases that flourish with excessive wetting of foliage or that are spread through runoff are eliminated or easily contained.

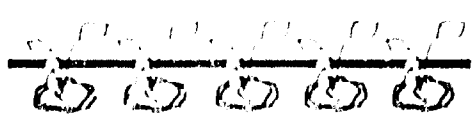
Micro-irrigation is a perfect system for use in areas where traditional sprinkler, furrow, and flood methods are not applicable. Irrigation can be extended to steep slopes and other areas that cannot be leveled with no erosion or run off problems. For highly permeable soils with low water holding capacity (sands, desert pavement, or tropical soils) or for soils that hold too much water, micro-irrigation offers a valuable alternative.

Cost Savings

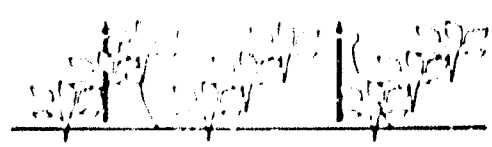
Micro-irrigation brings maximum efficiency. Since water is brought directly to each plant, there is no need to flood fields, irrigating areas where there is no plant growth and losing water to evaporation and seepage. This is an important benefit in terms of costs associated with purchasing water as well as overall water conservation.

Energy needed to operate pumps is reduced because less water is needed to reach plants in the field. Fertilizers applied directly through the system are more effec

Drip Irrigation



Mini Sprinkler Irrigation



tive, and because a smaller area is being fertilized, less fertilizer is needed or wasted on unplanted areas. Control of water in the field also brings some amount of weed control. Because large areas that offer a suitable growing environment for weeds are reduced, so too are the costs associated with herbicides.

Micro irrigation systems require lower water pressure than other systems. Pumps, filters, and lines can be sized accordingly and used more efficiently over a longer period of time.

In some cases, water with high salinity can be used with a micro irrigation system because salt and impurity build up in the soil is reduced due to continuous irrigation and a high moisture content. Salts are leached away from damp root zones to dryer areas. Of course, tolerance to poor quality water depends on the crop and properties of the soil.

Flexibility

Micro irrigation systems can be operated manually or by computer for complete automation. This gives the farmer important options for managing irrigation, labor, and equipment during the growing season.

Partial wetting of the field means dry furrows and unrestricted travel for farm equipment. There is less soil disruption and compaction requiring additional soil preparation work and field maintenance.

Most importantly, micro irrigation gives the farmer greater control over the crop. Water can be withheld in response to weather changes, and more or less fertilizers can be applied to speed or delay growth.

DISADVANTAGES

Micro-irrigation systems have high installation and start-up costs that can be recovered through increased yields, better efficiency, and cost savings through the years. They also require professional site analysis, system design, and installation. A strict maintenance regime also is needed to ensure cost effective use and a long system life.

The network of drip lines and mini-sprinklers is susceptible to clogging in three ways. Physical blockage occurs most quickly as the result of sand and fine gravel, sediment, and water impurities. Clogging as the result of chemical problems (precipitates, iron, manganese, or sulfur deposits) or for biological reasons (slime, algae, insect parts, and plant roots) develop over a longer period of time. There are methods to reduce clogging, but some clogging can be expected with any system.

Mechanical damage to a micro-irrigation system can occur from rodents, birds, and farm equipment. This can be reduced by covering drip lines with a shallow layer of soil or providing an alternative water source for wild animals.

Clogging can be Prevented

Two methods to prevent clogging are used at the project.

- Every three weeks all drip lines are opened and flushed to remove sediments and other blockage.
- After harvest, a solution of hydrochloric acid is run through the lines to dissolve any chemical precipitants that may have accumulated.

Micro-Irrigation Technology Up Close

Micro-irrigation is one of the most effective methods of providing crops with the exact amount water and nutrients they need for optimum growth. An outline of the micro-irrigation system installed at the Akhmad Yasawi Collective Farm Vegetable Project detailing the filtration system and network of permanent and temporary water lines follows.

The entire irrigation project was installed with a central computer control that regulates water pressure, flow and fertilizer application throughout the field. The system also may be operated manually.

1. A 300 cubic meters Belarus electric pump draws water into the irrigation system from a pumping pool fed by an existing irrigation ditch. For this application, an electric motor was selected because it is expected to provide more trouble-free operation than a diesel pump for the life of the system.

2. First, the water must be filtered to remove suspended particles and other debris that can clog the sprinkler or drip lines. Two **circulating hydrocyclone and sand filters** use the spinning action of the water and centrifugal force to separate heavy materials (sand and small gravel) which sink to the bottom.

3. The water is cleaned again in a process called **backflushing**. Water is pumped through a series of five **gravel filters** where additional contaminants are removed. Clean water continues to the irrigation system, and contaminated water is pumped to a sediment pool. Filters are flushed as often as every 30 minutes to remove impurities during the peak growing season.

4. Following the backflushing process, fertilizer may be mixed with the water for uniform distribution in the field with irrigation.

5. Water is carried to the field in a main pipe line, then fed to hydrants and outlets throughout the field.

6. Four primary valves regulate water flow to the irrigation network. When line repairs are needed or when irrigation is required in only part of the field, these valves can shut off water flow. Primary valves have access spigots that allow fertilizer to be added manually to a particular area.

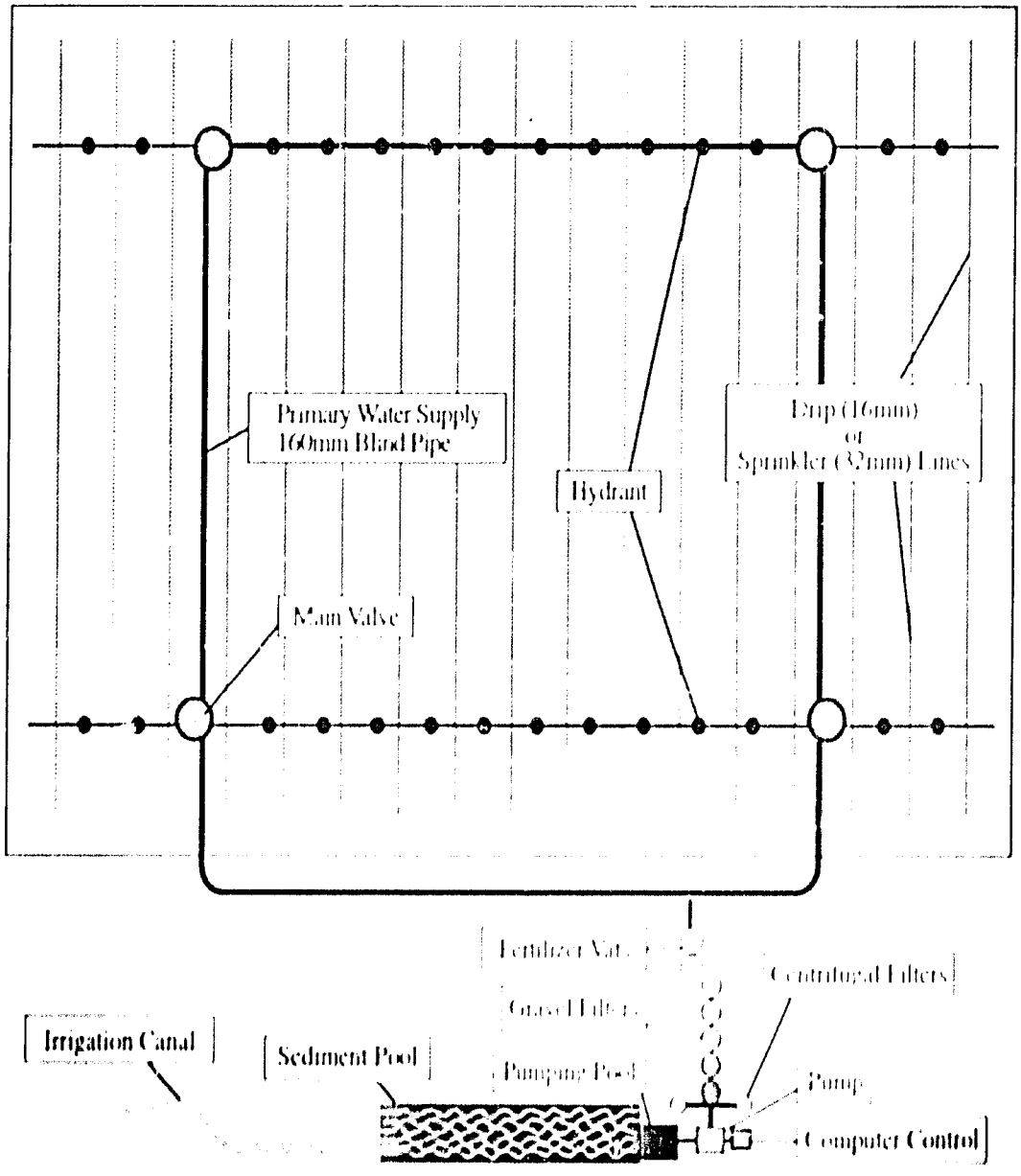
7. **Drip lines** carry water throughout the field. Some crops require one line per bed, while others require two. The size of the drip line used is determined by dimensions of the field and the water pressure needed. Drip lines have small openings every 60 cm. Under low pressure, water flows through the lines and provides a continuous drip of water during irrigation.

8. Depending on the needs of the crop, **mini-sprinklers** may be added to the irrigation net work. They are fed by light weight plastic lines and are held above the crop on small rods. Mini-sprinklers used at the Vegetable Project irrigate an area 7.5 x 6.3 meters and are particularly effective during germination.

Irrigation System Diagram

Akhmad Yasawi Collective Farm Vegetable Project

Approximately 40 Hectares



Crop Detail

The following overview summarizes field preparation and crop performance during the 1994 growing season.

Field Preparation

During spring 1994 following installation of the irrigation system, the field was leveled and tilled. Specific soil preparation steps during the planting season are noted for each crop.

A soil analysis was conducted to determine the nutrients needed to support good vegetable production. Although nitrogen, potassium, and phosphate are considered to be essential for optimum plant growth and yield, potassium was not available on the Akhmad Yasawi Collective Farm. In some instances, the amount of potassium needed for ideal growth of a particular variety is noted, but was not applied during 1994.

Raising Crops for Transplanting

Varieties of two crops—tomatoes and cabbage—were germinated in separate plots and transplanted to the field. Transplanting is particularly cost effective if the variety planted is an expensive hybrid seed. It also ensures better field performance and shortens maturation time. Additionally, some water savings can be achieved because irrigation necessary for germination is contained to a smaller area. A 0.05 hectare plot and hotbox were prepared for tomatoes, and cabbage plants were raised on 0.5 hectares. Once cabbage plants were moved to the field, the transplant field was used to raise crops for local markets.

ONION

Variety

- Ben Shemen—a large, summer-maturing Israeli variety that can be stored for 7 to 8 months.

Sowing

Onion was the first crop sowed in April 1994. Five to six kilograms of seed per hectare were sowed by machine, a sharp reduction from hand sowing methods which used 20 kg per hectare.

Due to difficulties with electrical supply to the project's pump, irrigation did not begin until mid-May. As a result, ideal growing conditions were not maintained during germination and early plant development.

Fertilization

Phosphate was applied at 150 kg per hectare, and nitrogen was applied at 100 kg per hectare before sowing. An additional 200 kg per hectare of nitrogen were applied through irrigation during the growing season.

Irrigation

Onions were irrigated every two to three days according to plant development at 8,000 cubic meters per hectare. Because onions are late maturing plants, this continual access to water is important in establishing a healthy, productive crop.

Crop Control

Nortron was applied as a pre-emergent herbicide immediately after sowing.

Stomp® was applied as a post-emergent herbicide after about three weeks of growth (when one leaf was visible).

During the first half of the growing season, two applications of methamidophos, and one application each of talstar and cypermethrin were sprayed to control trips infestation.

Harvesting

Harvesting began on September 29 and continued through October 11. Crop performance was disappointing due to the early electrical problems with the pump.

Comments and Suggestions

Onion plants are slow to mature and do not compete well with fast-growing weeds for nutrients and water. For this reason, weeds must be eliminated from the field to achieve maximum yields.

TOMATO

Varieties

- Hazera 5052 - a large Israeli hybrid with a long shelf life.
- Hybrid 785 - a U.S. hybrid, good for canning.
- M-82-1-8 - an Israeli variety, good for canning.

Planting and Sowing

Both hybrid varieties (Hazera 5052 and Hybrid 785) were germinated in a hothouse and should have been transplanted to the field after about 45 days of growth. Instead, difficulties with the pump delayed transplanting for an additional 30 days, and as a result, plants did not adapt well in the field.

The M-82-1-8 variety was sowed by machine at 1.1 kg of seed per hectare at a depth of 1 cm. Germination occurred in 8 days. All canning tomatoes were planted in two rows per bed. Tomatoes for market were planted in one row per bed.

Fertilization

As part of the soil preparation process, 100 kg of nitrogen per hectare (40 percent of the total crop requirement) and 120 kg per hectare of phosphate were applied to the field. The remaining nitrogen, 160 kg, was applied through the irrigation system from the time of flowering to fruit maturation (when fruit begins to change color). If potassium had been available, it would have been applied at a rate of 300 kg per hectare before sowing.

Irrigation

Beds were irrigated with mini-sprinklers three times throughout the germination period. Following germination, all areas were irrigated with drip lines at a rate of 6,000 cubic meters of water per hectare.

Crop Control

A pre-emergent herbicide, napropamide, was applied directly after sowing at a rate of 4 kg per hectare. Napropamide prevents germination of most weeds.

One application of copper hydroxide was used to control bacterial blight, and endosulfan was used to control aphids and caterpillars. Clethodim was sprayed one time to control grass after thinning. In July, one application of endosulfan and chlorobenzilate was sprayed to control rusty mites.

Harvesting

Tomato harvest should be conducted delicately to protect plants and ripening fruit from damage. When harvesting canning varieties, wait until 90 percent of the fruit has matured and harvest the entire field at once. For market varieties, special care should be taken to avoid fruit damage.

Comments and Suggestions

Once 20 percent of the individual fruit begins to change color, it has concluded the growth process. Continued application of water and nitrogen will not enhance yield.

CUCUMBER

Variety

Tamra - a hybrid variety from Israel that is easy to grow and slightly smaller than local Uzbeki varieties.

Sowing

Cucumber seed was sowed by machine on May 18 at 17 seeds per meter. After germination, plants were thinned to seven per meter. The crop had no special problems with insects or diseases, and temperature and climate resulted in good crop performance.

Fertilization

Before sowing, the soil was fertilized with 70 kg of phosphate and 100 kg of nitrogen. Had potassium been available, it would have been applied at 250 kg per hectare. During the growing season, 120 kg of nitrogen was added through the irrigation system.

Irrigation

Cucumbers were irrigated every three days using drip lines according to the development and needs of the plants.

Crop Control

Methamidophos was sprayed to control aphids three times during the growing season. No herbicides were applied prior to sowing, but the post-emergent clethodim was used to control Bermuda grass.

Harvesting

Harvesting by hand began in early July, 47 days after sowing, and continued for 30 days. The crop had good vegetation and flowers set fruit well. A maximum yield depends on delicate picking to protect plants, flowers, and developing fruit from injury. This is more important than any other factor in realizing a good harvest.

Comments and Suggestions

Sorting fruit by size and packing for transportation to market is essential to achieving the best prices. Cucumbers were packed in sacks because no materials were available. This contributed greatly to fruit spoilage.

POTATO

Varieties

- Romano - a medium-sized red variety from Holland that was available at the farm.
- Fresco - an early white variety from Holland also available at the farm.

Crop Detail

Sowing

Romano potatoes were machine sowed June 28 with a space of 30 cm between seeds and 75 cm between rows, for a total of 44,000 plants per hectare. Eneco potatoes were sowed July 21 with 25 cm between seeds and 75 cm between rows for a total of 60,000 plants per hectare. Germination occurred in 14 days.

Fertilization

Before planting, 300 kg of phosphate and 150 kg of nitrogen were applied to the field. After planting, nitrogen was applied weekly with irrigation at 160 kg per hectare during the growing season.

Irrigation

During germination, the potato field was irrigated with sprinklers at a rate of 4 mm per day. Following germination, the field was irrigated at a rate of 120 cubic meters per hectare every three days up to 210 cubic meters every three days during the growing season.

Crop Control

Ten days after sowing and before germination, prometrytne was sprayed at 2 liters per hectare to control weeds. Cypermethrin was sprayed five times to protect the crop against Colorado beetles. The crop was free of other diseases.

Harvesting

October 10 and 14 diquat was sprayed to kill potato foliage before harvesting. Dead foliage was trimmed away one day prior to picking. Hand harvesting began on October 21.

Comments and Suggestions

Less than 50 percent of potatoes germinated because of poor quality seeds.

Keeping the field continuously moist during the growing season is essential to maintaining healthy, productive plants. Do not stress plants by allowing the field to dry between irrigation.

CABBAGE

Varieties

- Green Express – an early maturing Japanese variety that produces a small compact head weighing on average from 1.5 to 2 kg.
- Conquistador – a late maturing Japanese variety that produces a medium sized compact head weighing about 4 kg.
- Uzbekistan F1 – a local variety that produces a large uneven head weighing from 6 to 8 kg.

Sowing

Cabbage was sowed June 4 in a 1.5 hectare area for trans planting at about 40 seeds per meter or 4 kg per hectare. Germination occurred in 6 days, producing 67,000 plants per hectare. Eighty percent of the plants were grown for farm use with the remainder saved for market. The trans planting area was fertilized with 100 kg of phosphate per hectare and 120 kg of nitrogen per hectare. Chlorthal-dimethyl was used at 11 kg per hectare as a pre-emergent herbicide. About 4,000 cubic meters of

water per hectare was used from sowing to transplanting.

After germination, endosulfan was sprayed two times to kill cabbage looper larvae at 3 l. per hectare per spraying.

Cabbage plants were transplanted after 32 days along drip irrigation lines. Green Express and Constantador were planted at 45,000 plants per hectare, three rows per bed. Uzbekistan 1 was planted in two rows per bed for 32,000 plants per hectare.

Fertilization

Prior to transplanting, phosphate was applied at 120 kg per hectare, and nitrogen was applied at 100 kg per hectare. An additional 100 kg per hectare of nitrogen was applied through drip irrigation during the growing season.

Irrigation

After cabbage plants were transplanted, the field was kept moist for about two weeks until the plants had adapted to the field. Plants were irrigated every three days from July through October.

Crop Control

To control weeds, diquat and oxyfluoren were applied at 2 l. per hectare prior to transplanting. The crop was sprayed four times to control aphids and cabbage looper infestation with endosulfan, methamidophos, and chlorpyrifos.

Harvesting

Harvesting began September 15 with the Green Express variety, followed by Uzbekistan 1 on October 20, and Conquistador in early November.

Comments and Suggestions

Because the Green Express variety is so uniform in growth, the field matures at virtually the same time. For that reason, farmers must plan ahead to ensure that harvesting can be done quickly to reduce field loss. This is not a problem with the other two varieties planted.

CARROT

Varieties

- Nanty - a red variety from Holland.
- Uzbekistan Yellow - a local yellow variety .

Sowing

Carrots were machine sowed at 500,000 to 700,000 seeds per hectare (3 kg). Four rows per bed were planted at 1 cm deep. Germination occurred in 10 days.

Fertilization

Phosphate was applied at 170 kg per hectare and nitrogen was applied at 120 kg. per hectare before sowing. During irrigation, an additional 130 kg per hectare of nitrogen was applied through the drip irrigation lines.

Irrigation

Irrigation began with sowing on July 3 and continued through October 20 at a rate of 6,000 cubic meters per hectare. Two drip lines were used per bed.

Crop Control

When the plants were about 30 days old (with three leaves visible) the field was sprayed with a herbicide to reduce weed

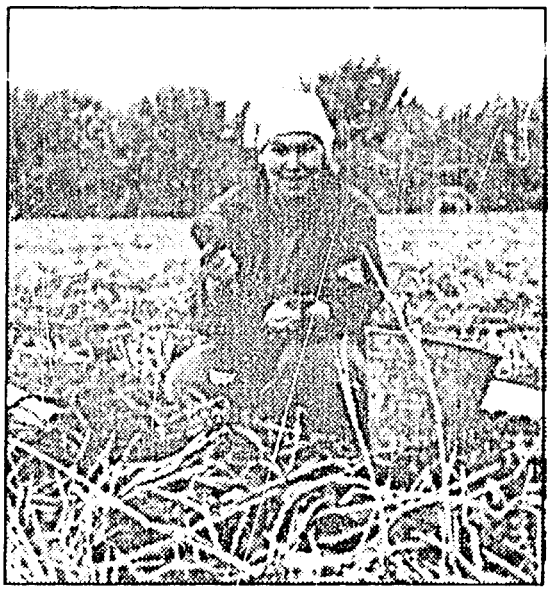
Crop Detail

problems. Half the crop was sprayed with prometryne at 2 liters per hectare and half was sprayed with linuron at 1.8 liters per hectare.

During the growing season, the Israeli variety had a high rate of mildew. Triadimenol was sprayed at a rate of 500 g per hectare, and the crop was dusted three time with sulfur at 40 kg per hectare to control the mildew problem.

Harvesting

Harvesting began in early November when the carrots had reached a marketable size.



For more information about the Akhmad Yasawi Collective Farm Vegetable Project contact:

Igal Cohen, Director
Akhmad Yasawi Collective Farm Vegetable Project
(3712) 32-71-14

A. G. Mashakhipov, Chairman
Akhmad Yasawi Collective Farm
(829) 83-22-11

Embassy of Israel, Tashkent
(3712) 56-57-79 or 56-78-23

Характеристка Овощей

Контроль Урожая

Через 30 дней, когда уже были видны три морковных листа поле опрыскивали гербецидом, для того, чтобы сократить рост сорняков. Одну часть урожая опрыскивали прометрином (promethrine) (2 л Га.), а оставшуюся часть линуроном (linuron) (1.5 л Га.)

В вегетационный период Израильская разновидность имела высокий процент мучнистой росы (плесень). Поэтому распыляли 500 гр. триадименола (triadimenol) на 1 Га. Для этого была использована сера (40 кг Га.) для борьбы с мучнистой росой.

Сбор Урожая

Сбор урожая начался в начале ноября. К тому времени морковь достигла определенного размера для сбыта на рынке.

Для подробной информации о проекте овощей в колхозе "Ахмад Ясавий" просим связаться:

Игал Кохен, Директор Проекта
(3712) 32-71-14

А.Г. Машаханов, Председатель колхоза
(829) 83-22-11

Посольство Израиля в Ташкенте
(3712) 56-57-79 / 56-78-23

APPENDIX G: Trainees from the CAR/Georgia trained in Israel (1992-1995)

1992/93	Kazakhstan	Kyrgyzstan	Uzbekistan	Georgia	Others	Total
1. Agricultural Study Tours for Decision Makers	9 (4.5)	7 (3.5)	6 (3)	16 (8)	-	
2. Dairy Cattle Breeding	6 (4.5)	8 (6)	7 (5.25)	7 (5.25)	-	
3. Agro Climatic Data	-	-	1 (1)	-	-	
Sub-Total.....	15 (9)	15 (9.5)	14 (9.25)	21 (13.25)	-	65 (41)
1993/94						
4. Irrigation & Extension	5 (5)	6 (6)	5 (5)	5 (5)	-	
5. Vegetable Growing	3 (3)	6 (6)	5 (5)	5 (5)	3 (3.75)	
6. Economic Management & Agric. Development	5 (5)	5 (5)	5 (5)	4 (5)	2 (2)	
7. Vegetable Cultivation	5 (6.25)	-	6 (7.5)	3 (3.75)	3 (3.75)	
8. Irrigation & Extension	5 (6.25)	-	6 (7.5)	2 (2.25)	5 (6.25)	
9. Agriculture in Arid Zones	1 (2)	-	-	-	-	
10. Biological & Physical Aspects of Crop Growth	3 (5.25)	-	-	-	-	
11. Hydrometerology	1 (1.25)	-	-	-	-	
12. Development of Arid Zones	1 (0.25)	-	1 (0.25)	-	-	
13. Agro-Climatic Data	-	-	1 (1)	-	2 (2)	
14. Hospital Management	-	-	-	-	2 (4)	
15. Young Women Leaders in T.U.	2 (1)	-	1 (0.5)	-	1 (0.5)	
Sub-Total.....	31 (35.25)	17 (17)	30 (31.75)	19 (21)	18 (22.25)	115 (127.25)
1994/95						
16. Organization & Management & Development of Economics	15 (108)		-	-	-	
17. Dairy Cattle Husbandry	4 (5)	4 (5)	5 (6.25)	5 (6.25)	-	
18. Special Course for Doctors	12 (18)	10 (15)	10 (15)	-	-	
19. Special Courses for Nurses	9 (13.5)	9 (13.5)	10 (15)	-	-	
20. Labour Relations	1 (0.5)	1 (0.5)	-	-	-	
21. Organization of Volunteers Manag.	1 (0.75)		-	-	-	
22. Biological & Physical Aspect	3 (5.25)	-	2 (3.5)	-	2 (3.5)	
23. Develop. of Family Farms & Sup. Syst.	6 (4.5)	3 (2.25)	7 (5.25)	4 (3)	3 (2.25)	
24. Exploration, Exploitation & Manag. of Ground Water Resources	1 (3.5)	-	-	-	-	
25. Re-use of Waste Water	1 (1)	-	-	-	-	
26. Agricultural Field Services & Greenhouse Prod. Practices	5 (3.75)	5 (3.75)	-	4 (3)	-	

APPENDIX G: Trainees from the CAR/Georgia trained in Israel (1992-1995) (continued)

1994/95 (continued)	Kazakhstan	Kyrgyzstan	Uzbekistan	Georgia	Others	Total
27. Environmental Education, Conservation & Public Action	1 (0.75)	-	-		-	
28. Grain Storage	6 (4.5)	4 (3)	4 (3)	4 (3)	2 (1.5)	
29. Agric. Mechanization & Extension	7 (5.25)	4 (3)	5 (3.75)	4 (3)	2 (1.5)	
30. Rural Schools & Agr. Education	2 (2)	-	2 (2)	-	-	
31. Economic & Urban Develop.	1 (1)	-	-	-	-	
32. Extension & Agric. Manag.	5 (6.25)	4 (5)	2 (2.5)	-	-	
33. The Role of Labour Movement in Develop.	1 (1.50)	2 (3)	-	-	-	
34. Develop. & Manag. of Tourism	2 (2)	-	1 (1)	-	1 (1)	
35. Educational Technology	1 (1)	2 (2)	2 (2)	-	3 (3)	
36. Dairy Cattle Husbandry	4 (4)	3 (3)	4 (4)	3 (3)	1 (1)	
37. Individual Training	5 (36)	1 (9)	-	-	1 (1.75)	
38. Planning & Manag. of Agric. Projects	-	1 (1.75)	-	-	-	
39. Irrigation & Soil Manag.	-	-	1 (2)	-	-	
40. Agrometeorology in Arid Zones	-	-	1 (1.5)	-	-	
41. Community Education	-	-	1 (1)	-	-	
42. Field Crop Modelling	-	-	1 (1.25)	-	1 (1.25)	
43. Hydrometeorology	-	-	1 (1.25)	-	-	
44. Agric. Engineering for Small Farm	-	-	2 (4)	-	-	
45. Agroclimatic Data	-	-	1 (1.25)	-	-	
46. Medical Training	-	-	-	-	2 (6.5)	
47. Integrated Environmental Management	-	-	2 (1.5)	-	-	
48. Management of Energy Utilization & Conservation	-	-	1 (1)	-	-	
49. Strategy & Technology for Environmental Friendly Agr.	-	-	1 (1)	-	-	
Sub-Total.....	93 (228)	53 (69.75)	66 (79)	24 (21.25)	18 (23.25)	254 (421.25)
GRAND TOTAL.....	139 (272.25)	85 (96.25)	110 (120)	64 (55.5)	36 (45.5)	434 (598.5)

Remarks

(A) Others (Armenia, Azerbijan, Turkmenistan, Tadjikistan

(B) Includes total trainees financed from all sources (not only USAID)

(C) 1992/93 from 1.10.92 30.9.93
1993/94 from 1.10.93 30.9.94
1994/95 from 1.10.94 30.9.95

(D) Number in brackets Person months of training

APPENDIX H: Memorandue of Understanding for the Quadrilateral Program (including annex 1,2, & 3)

MEMORANDUM of UNDERSTANDING

On the 27 July 1994 a meeting took place in Ankara at the TICA offices between representatives of the Governments of Israel, Turkey and the United States of America to discuss possible quadrilateral cooperation programs in Turkmenistan and Uzbekistan. The meeting was chaired by Mr. Ismet Bakirli who was appointed by the Turkish Government to promote operational agricultural and rural activities within the envisaged quadrilateral cooperation. The United States was represented by Mr. Donald Mooers, Senior Advisor to the Coordinator of U.S. Assistance to the New Independent States. He was accompanied by Mr. Ricardo Roberto of the U.S. Embassy in Ankara. The Government of Israel was represented by Mrs. Julia Margulies of the Development Study Center in Israel and Mr. Yitzhak Abt, Director of the Center for International Cooperation, which conducts its activities under the aegis of Mashav, The Center for International Cooperation of the Ministry of Foreign Affairs. They were accompanied by Mr. Eitan Naeh of the Israeli Embassy in Ankara.

The participants endorsed the idea of developing an innovative quadrilateral program for cooperation, geared towards the transition to an open market economy. The participants reorganized the budgetary constraints facing the partners and proposed that cooperative efforts focus on the establishment of demonstration farms, rural and agri-business centers, and the promotion of agricultural and agribusiness training.

1) The model demonstration farms would be located in the same region as the rural and agri-business centers (RABCs) to encourage entrepreneurship and the adaptation of innovative technologies relevant to the demands of a growing open market economy. The model demonstration farm unit would be developed over a three year period and would transfer technological know-how and support outgrowers in its vicinity.

2) The training program would aspire to train trainers and assist farmers and rural entrepreneurs in making the adjustment to the market economy by exposing them to agriculture and business practices in Israel, Turkey and the United States. The latter would concentrate on the training of entrepreneurs in agribusiness initiatives. Training will include in-country programs, as well as exchanges in the three partner countries. The three countries will attempt to define existing resources and agricultural expertise which will be mobilized to provide skills development.

3) The Rural and Agri-Business Centers would be established to encourage entrepreneurship both in aspects of farm production, processing, distribution and marketing, as well as in non-agricultural business activities in rural areas.

The participants agreed to review the results of the meeting with their respective governments and suggested follow-up actions to further the objectives of the joint cooperative program. Upon its approval by the Governments of Israel, Turkey, and the United States of America, the program would be proposed to the Governments of Turkmenistan and Uzbekistan. It was suggested that a field mission, comprised of representatives from each country, travel to Uzbekistan and Turkmenistan to discuss with host governments the feasibility of the proposed project and develop a working plan to advance the goals of the quadrilateral program.

The participants suggested that in the future a steering committee, comprised of representatives from each country, be created to plan and monitor the overall program.

This proposal incorporates the attached Annexes referring to the three main activities suggested.

This Memorandum Of Understanding is prepared in English and Turkish languages and signed at Turkish International Cooperation Agency on the date of 31st October 1994.

On BEHALF of The GOVERNMENT of ISRAEL	On BEHALF of The GOVERNMENT of TURKEY	On BEHALF of The GOVERNMENT of The U.S.A
H.E. DAVID GRANIT AMBASSADOR The EMBASSY of ISRAEL ANKARA	H.E. UMUT ARIK PRESIDENT TURKISH INTERNATIONAL COOPERATION AGENCY	H.E. RICHARD CLARK BARKLEY AMBASSADOR The EMBASSY of The UNITED STATES ANKARA

Annex I: **DEMONSTRATION FARM UNITS**

The participants proposed the setting-up of two demonstration farm units, linked to a rural and agribusiness center (RABC). The sites would be near Ashkabad in Turkmenistan and Tashkent in Uzbekistan.

The purpose of such demonstration units would be to acquaint local farmers with new technologies relevant to a growing market economy. The farm demonstration units would be established within an existing infrastructure. If additional infrastructure is required, the costs should be borne by the host country.

The demonstration units will concentrate on the introduction of high value crops and diversification of field crops. Preferably, the unit's irrigation system will be a pressurized system. Prior to deciding on the details of the demonstration farm unit, pre-planning activities would be required to identify agrological and hydrological problems, market potential and land amelioration measures. The eventual site selection would be made by the host government. Therefore, the pre-planning mission should include personnel and representatives of the host country.

The site of the demonstration farm unit would represent the size of a viable family farm enterprise, based on field crops, vegetables and fruit, approximately 50 hectares.

Subject to pre-planning mission findings intensive livestock husbandry (namely sheep, dairy husbandry, and poultry) may be included. The farm would be managed on a business accounting basis. In principle the quadrilateral program would be expected to supply imported special inputs, whereas the local authorities would provide, on a timely basis, all local inputs (Fertilizer, farm implements, animal concentrates, local seeds, pesticides, transportation, managerial, land, and farm labor). The management of the demonstration farm unit must carefully register input-output results as well as provide continuous reporting of adaptive research results that would be used by the rural and agribusiness center for wider dissemination. It is envisaged that each demonstration farm would have the benefit of two long term expert assignments backed up by short term specialist missions. Each farm demonstration unit should have a technical assistance component from Turkey and Israel of about 55 person. months over a three year period. The commodities of foreign origin for each farm would be in the range of US$ 300.000. The estimated cost of establishing one demonstration farm unit is approximately US$ 700,000 (personnel included) over a period of three years.

This program would be closely linked to a practical training schedule in Turkey, Israel and the United States. the latter particularly in relation to planned agribusiness centers. A modest program of research and development on the chosen sites is envisaged to accommodate new genetic plant introductions, irrigation technology and agronomic innovations costing about US$ 90.000 per farm.

The program would be planned and monitored by a three person steering committee representing Turkey, the United States and Israel. Each farm demonstration unit would periodically conduct a technical committee meeting. Day to day management procedures would be structured by the pre-planning mission.

Annex II: ***RURAL AND AGRIBUSINESS CENTERS***

1. The Development of the private sector is very important for the future of the Turkmenistan and Uzbekistan economic systems. A joint program between Turkey, Israel and United States of America would aim to assist in the promotion of the market system through the development of Rural and Agri-Business Centers (RABCs), one inTurkmenistan and other in Uzbekistan.

The RABCs would provide support services for farmers and rural entrepreneurs.

2. The main functions of the RABCs would include :

(A) Providing information training consultancy services, extension outreach and the design of projects that may be submitted for funding to banks and other financial institutions.

(B) Providing information on topics important to promoting private sector farms and enterprises.

(C) The subjects for training that should include: farm management, how to operate in a free market system, irrigation, food processing, business planning and other related subjects.

(D) Providing farmers and agribusinesses with individual consulting services on an on-going basis.

(E). Serving an information sources on how to establish business and trading relations with Turkish, Israeli and American partners.

3. The RABCs should be located in the same regions as the demonstration farms. They should provide assistance to clients on a continuing basis, as well as serve associations of private farm owners.

4. The participants suggested that in the future, a steering committee, comprised of representatives from each country, be established to plan and monitor the overall program.

5. Resources to develop the RABC's should include:

A. From the Uzbekistan and Turkmenistan Governments:
- *Office and local support*

3. From the Governments of The United States, Israel and Turkey:
- *One long term advisor (2 years)*
  - *Peace Corps or UN Volunteers (either Turkish or Israeli) for each RABC*
- *Short-term expertise*
  - *9 person-months for each center*

Annex III: ***TRAINING***

1. It is understood that training methods would comprised both on-the-job (informal) and formal training. Training should take place in Turkey, Israel and The United States since all the three countries have the required infrastructure.

2. The possibility of offering courses in Turkmenistan and Uzbekistan should be considered.

3. Training programs should be designed to teach the trainers, who would then be able to transfers skills learnt to farmers in each country.
-In identifying appropriate trainers the task force would ask for the assistance of the local government concerned.

4. Training topics for countries with respect to their experience and expertise would be as follows :

TURKEY
- Irrigation(open) surface
- Production techniques and technology
- Agricultural economics

ISRAEL
-High value crops and advanced irrigation(pressure) techniques
-Farm management towards market economy
-Dairy husbandry

The UNITED STATES
-Expertise development
-Enterprise management

The pre-planning mission should consider the possibility of linked training programs, particularly in the areas of local economic development, entrepreunership and development, and integrated rural development. These courses should be offered in both Israel and Turkey.

Training topics appropriate to characteristics of each country or specific region would also need to be taken into account.

Other course topics could be added after existing courses in each country are defined.

5. Each training course should draw up to 25-30 trainees from each country.
-If local conditions require, specific courses tailored to the needs of each country could be conducted.

6. The training costs in Israel would total USD $ 75.000(for 30 trainees)
individual/month USD $ 2.500
Training costs in Turkey would total USD $ 50/individual/day for food and lodging (instruction fees are not included).
The U.S. member of the pre-planning group should provide information concerning training costs in the United States.

7. Informal training programs could be defined and /or developed.

8. Turkey and Israel are able to offer apprentice training programs linking young and leading farmers from the beneficiary countries with veteran farmers and enterprises in the United States, Turkey and Israel.

9. It is suggested that the task force conduct a field survey as soon as possible.

The participants also suggested that the pre-planning group consider the following questions:

How will each country support training?
-Financial
-Technical Assistance
-Premises

Which institutions should be involved in training?
-Universities
-Government Ministries
-Agricultural Training Centers
-Individual farmers / technicians
-Non-governmental organizations