



Syria-Jordan-Lebanon-Palestinian Authority  
GEF/UNDP/ICARDA/IPGRI/ACSAD

# Dryland Agrobio

Conservation and Sustainable Use of Dryland Agrobiodiversity  
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## Role of dryland agrobiodiversity in sustaining the livelihood of rural populations of West Asia

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*Local agrobiodiversity is important in creating food security at the farm level.*

### 1. Biodiversity in the drylands of West Asia

The importance of West Asia's dryland agrobiodiversity was recently recognized as the basis for sustaining food security and agricultural development worldwide. West Asia encompasses one of the three nuclear centers of origin of agriculture and is known to be the center of diversity of several food crops of global importance. The most important crops that this region has given the world are wheat, barley, lentils and other food and forage legumes, as well as several nut and fruit trees. Together these plant species support the livelihood of one-sixth of the world's population (Harlan, 1992). Cereal crops alone provide 38% of world food supply. The region is also an important source for commercial and industrial products such as gums, resins, oils and biocides as well as medicinal plant products.

Though the number of species is less in the drylands than the tropics or semi-tropics, the former are char-

acterized by high degree of endemism, extensive within-species variation and high-value products for industrial and pharmaceutical uses. Furthermore, dryland species whether in the form of cultivated landraces or their wild relatives, have accumulated a wide range of adaptive traits to harsh environments, making them important sources of genes for stress resistance in breeding for drought, cold, salinity, diseases and pests as well as other production constraints. They also play a significant role in alleviating the major global concerns of desertification and global warming. The drylands also provide habitats for wildlife and are critical to the survival of many migrating species (Christiansen and Vaughan, 1997).

On the other hand, in the harsh environments where the cultivation of crop landraces and livestock raising are the main activities, agrobiodiversity still remains the basis of rural livelihoods. The diversity of crops at the farmer's level provides for income security in case of failure of one crop, while at the community level, it allows distressed farmers to exchange seeds with other farmers and plant again the next season. Landraces (local varieties) are genetically diverse and, therefore, are never completely susceptible to adverse conditions, allowing for at least what is known as minimal yield under unfavorable conditions. The occurrence of landraces of many species and their wild relatives side by side in this region allows for gene flow, resulting in high levels of genetic diversity and an influx of stress resistance genes from the wild to the cultivated which increases their value for use in crop improvement programs (GEF, project document 1999).

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The overall value of landraces exceeds their value as a genetic resource for resistance breeding. Their importance lies also in their superior quality value especially for local tastes and local food culture. It is, therefore, not surprising to note that throughout West Asia, as in other parts of the world, subsistence farmers grow local varieties of crops for their own use at home, while they grow the improved varieties for the market. Nor is it surprising that the cash value of the landraces on the market is higher than the common widely adapted high yielding improved varieties (Jarvis et al. 2000) probably due to their limited availability.

## 2. Threats to dryland agrobiodiversity

The dryland ecosystem of West Asia is a highly fragile system; biodiversity is easily lost and replenishing it is more difficult than in other more humid ecosystems. Agriculture in these ecosystems is the major economic activity where livestock forms an integral part of the system. Recognizing the high interdependence between water, soil and biodiversity, any excess use of the natural resources would lead to losses in the biodiversity of an ecosystem. In the case of the drylands this loss is usually irreversible. Habitat destruction is commonly the result of both natural climatic changes and human interventions.

The dryland ecosystems worldwide are experiencing alarming rates of habitat destruction and natural resources degradation. Results of studies show that 70% of arable land in the world and 90% in the West Asia and North Africa region are affected by desertification and 10 to 15% of plant species are endangered. Soil loss in the area is estimated at 10-60 kg/ha under normal vegetation cover, at 200-550 kg/ha in burned forest areas and at 3280 kg/ha in cultivated areas (Valkoun et al. 2001). Groundwater is being heavily depleted due to over-exploitation and it is estimated that by 2010 rangeland in West Asia will decrease by 22%, cropped areas by 21%, and forest land by 30%.

The major threats that affect dryland biodiversity at present include:

1. High population growth rates placing unsustainable pressure on natural resources;
2. Land reclamation, destruction of natural habitats,

deforestation, cultivation of marginal land and rangelands;

3. Overexploitation and overgrazing;
4. Switching to non-sustainable agricultural practices based on excessive use of inputs including high yielding narrow genetic base cultivars and introduced species;
5. Less adapted legislation and policies;
6. Loss of related local knowledge on resource use and little interest of youth in agriculture.

The degradation of rangelands that contain the wild plants of herbaceous and woody crops is critical. The major reasons behind rangeland degradation in West Asia include:

1. Overgrazing coupled with frequent droughts leading to the decline in productivity of rangelands and to a decrease in species richness, resulting in predominance of non-palatable species;
2. Expansion of cultivation into previously non-cultivated and marginal areas;
3. Breakdown of the traditional systems and mechanisms for sustainable management of shared resources;
4. Absence of clear and appropriate land tenure arrangements
5. Increased sedentary life-style of pastoral communities (decrease in transhumance and nomadic way of life, sinking wells, subsidized feeds, etc.).

## 3. Conservation and sustainable use of dryland agrobiodiversity in the Near East

The use of local agrobiodiversity in the drylands of the West Asia region still remains the basis of the livelihood of rural populations inhabiting these harsh environments. The main source of income of these communities is agriculture that integrates the cultivation of crop landraces with raising livestock. The degradation and loss of local agrobiodiversity and the related indigenous knowledge has significantly affected the livelihood of the local communities. There is an urgent need to revert the trend by promoting the sustainable use of agrobiodiversity.

The project on "Conservation and Sustainable Use of Dryland Agrobiodiversity in the Near East" is a regional project that is active in Jordan, Lebanon, the Palestinian Authority and Syria. It is funded by the

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Global Environment Facility (GEF), managed by United Nations Development Programme (UNDP) and executed nationally by the respective national agricultural institutions (Ministry of Agriculture or agriculture research institutes). The coordination of the project at the regional level and technical back-stopping is provided by the International Center for Agricultural Research in the Dry Areas (ICARDA) in cooperation with the International Plant Genetic Resources Institute (IPGRI) and the Arab Center for Studies of the Arid Zones and Drylands (ACSAD).



*Various local products are mostly for home consumption; the excess is sold in the local markets or given as presents to members of the family and friends.*

The project aims at preserving landraces and wild relatives of agricultural crops native to the region through community-based *in-situ* conservation. Among the target crops are wheat, barley, lentils, vetches and medics, almonds, apricots, olive, figs, grapes, pears and wild onions and garlic. Conservation, in this case, depends on the sustainable use of the agrobiodiversity by the local rural communities. To achieve its goals, the agrobiodiversity project is following a holistic approach that is based on (i) demonstrating appropriate technologies for increasing productivity; (ii) establishing markets and developing ways to add value to local agrobiodiversity; (iii) reforming policies and legislation to empower local communities, and (iv) increasing public awareness on the importance of conserving landraces and wild relatives of plant species originating from this part of the world (GEF, project document 1999).

## 4. Status of agrobiodiversity in the region

Two to three sites have been selected per country to act as pilot sites in which the project is actively working with the communities and monitoring the local agrobiodiversity. The selection of each site was based on the presence of the target crop species, eco-

logical and community characteristics. The selected sites are:

1. Jordan: Ajloun and Muwaqqar
2. Lebanon: Aarsal, Nabha, Ham and Maaraboun
3. Palestinian Authority: Jenin and Hebron
4. Syria: Sweida and Al-Haffa

Initial eco-botanical and socioeconomic surveys formed the basis of all further activities related to training and capacity building, technical demonstrations, policy development or legislation reforms. Surveys included formal detailed studies as well as semi-structured interviews and several sessions of group meetings with the community assessing the indigenous knowledge on the use of common and shared resources, the use of local biodiversity whether for food, feed, apiculture, medicinal or industrial purposes.

Results indicated that the important threats to agrobiodiversity in the area include land reclamation without appropriate studies as to the long-term feasibility of alternatives, the introduction of improved foreign fruit tree varieties at the expense of the rangelands, over-grazing, and quarrying. In the case of Sweida, Syria, for example, large-scale land reclamation followed by apple plantations tremendously reduced the rangeland areas. After 20-30 years of apple cultivation in that area, farmers are abandoning their orchards due to low yields resulting from severe disease epidemics, high input costs and reduced market prices of the apple varieties planted.

Survey results also indicated that farmers in the study sites in all 4 countries almost exclusively cultivate landraces of cereals and legumes and local grape, fig and olive varieties. Apple and cherry plantations, however, are almost always of foreign varieties.

Documented indigenous knowledge on the uses of local agrobiodiversity by the rural communities indicated that there are opportunities for further promoting these crops to enhance the livelihood of these communities. The adaptation of the local crops to the harsh environments in the project sites and the special quality characteristics of this local agrobiodiversity much valued by the rural communities provide the basis for the search of economic and cultural value-added to these crops for sustainable community-based biodiversity conservation.

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## 5. Activities to enhance community livelihoods through agrobiodiversity

The project is working at different levels to enhance the livelihood of the local rural communities through use of agrobiodiversity:

1. Improving the productivity and marketability of local products:
  - a. Improving the productivity of local varieties through demonstrations and training on water-harvesting techniques; seed cleaning and treatment; seed selection and development of new local mixtures of landraces
  - b. Improving the marketability of local products (local agrofood industries and honey) through training local communities on better processing, packaging and storage of local products; advertising the organic nature of the local products through quality tests and labeling of produce; and creating agrobiodiversity shops (Syria), agrobiodiversity weekly markets (Jordan) and participating in agricultural fairs (all 4 countries).
2. Empowering local communities:
  - a. Support and training of local communities on how to establish and manage local NGOs (cooperatives, associations). Training included conflict resolution, collective decision-making techniques, writing proposals for funding, etc. (Lebanon)
  - b. Technical and indirect funding support (through service contracts) to established NGOs to promote the establishment and use of community-based nurseries of local wild fruit trees for use in reforestation, as rootstocks, and landscape design (Lebanon and Syria)
  - c. Policy and legal support for the empowerment of the local community through the identification of traditional and present forms of organizations (farmers' union, cooperatives, NGOs, tribal systems, etc.) assess their capacity, strength and mandate to control and manage the common community resources and empower them accordingly through the development of national policies and legislation (on-going in 4 countries as part of the common policy framework developed and followed by the Project).



*Financial benefits are obtained for well packed and labeled local products.*

3. Investigating alternative and additional sources of income:
  - a. Improvement of apiculture through training, quality testing, packaging and marketing (all 4 countries)
  - b. Sustainable use of beneficial plants through documentation of local indigenous knowledge on use of these plants (Lebanon and Syria), the promotion and sale of medicinal plants on the local markets (Jordan and Syria)
  - c. Introduction of the eco-tourism within the target areas (Lebanon and Jordan), while combining the archeological heritage (historical ruins), the natural ecological heritage (topography, wild plants and natural beauty), the agrobiodiversity heritage (ancestors of crops) and the cultural heritage (local foods, local houses, etc.)

## 6. Lessons learnt

Results of surveys conducted and constant interaction with the local communities show that though they are very well aware of the importance of genetic diversity for their well-being, the present prevailing socioeconomic conditions in the poor subsistence farming communities have forced them to use non-sustainable practices that render a quick income to the farming households. Besides, local indigenous knowledge is quickly vanishing with the declining numbers of young farmers in these villages. There is an urgent need and great potential in the region for bringing back the value of local agrobiodiversity by making it a tangible source of income to these communities that will willingly protect it.

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The different national teams of the Dryland Agrobiodiversity Project have undertaken various steps in the direction of biodiversity valuation in rural farming communities. The national teams have coordinated their efforts to utilize a common framework, exchanged experiences and expertise but developed their own separate mechanisms to reach their common goals based on the local conditions and community characteristics. It has become clear that sustainable conservation of agrobiodiversity through use will require a holistic approach. Multi-disciplinary teams have to work together at the local, national and regional levels and several stakeholders have to be involved including the rural communities, research and development institutions, policy makers, the private sector and the general public.

### Literature cited

- Christiansen, S. and C.M.A. Vaughan (ed.). 1997. Conservation, management and sustainable use of dryland biodiversity within priority agro-ecosystems of the Near East. Highlights of the proceeding of a workshop, 31 October to 3 November 1995, Izmir, Turkey. ICARDA, Aleppo, Syria. xi + 54 pp.
- Global Environment Facility (GEF). 1999. Conservation and sustainable use of dryland agrobiodiversity in Jordan, Lebanon, Palestinian Authority and Syria. Project document in [www.gef.org](http://www.gef.org).
- Harlan, J.R. 1992. Crops and Man. Am. Soc. o Agron. Inc. Madison, Wisconsin, USA. 284 pp.
- Jarvis, D. I., L. Myer, H. Kelmick, L. Guarino, M. Smale, A.H.D. Brown, M. Sadiki, B. Sthapit and T. Hodgkin. 2000. A training guide for *in situ* conservation on-farm. Version 1. International Plant Genetic Resources Institute, Rome, Italy. 160 pp.
- Valkoun, J., E. De-Pauw and A. Amri. 2001. Impact assessment on land degradation and biodiversity in West Asia. Proceeding of the ESCWA workshop on natural resources management, Beirut, Lebanon. (in press).

### Community empowerment actions undertaken by the project in Lebanon

The dryland agrobiodiversity approach is based on promoting the conservation of local agrobiodiversity through the research of options that enhance the livelihoods of the custodians of agrobiodiversity and empower local communities to ensure the sustainable use of their natural resources. The Lebanese component of the dryland agrobiodiversity project has undertaken several activities in this regard:

- Support to the communities to establish cooperatives was provided through several visits and discussions on the advantages of cooperatives and local organizations, and providing information on procedures needed and support in completing forms. As a result, one cooperative was officially established in the project sites of Ham and Maaraboun;



World Bank representatives and project staff meet with local community in Aarsal to discuss the needs for local development.

- Priority needs of local NGOs and municipality of target communities were identified. Several meetings were undertaken with members of the established or already present local NGOs and the municipality (in the case of Aarsal) to set priorities within the arc of natural resources management and agriculture for possible development of proposals for funding;
- Direct support was given to the local NGO in Aarsal in developing proposals for funding. A proposal for funding activities related to awareness and extra-curricular activities for the youth by the Aarsal Rural Development Association in full support of the project staff (support in formulating the concept, structuring and writing the proposal) was submitted. The proposal was approved for funding by the Ministry of Environment;
- A young women's group was organized in the village of Nabha. The group of young women (aged 13 -18) is interested in getting to know their environment and wild plants, teaching fellow students about the environment and its national and global importance, developing awareness and educational activities with their fellow students in school and using the wild plants around them for generating family income. They have already been in

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Donor representatives visit project sites in Ham/Maaraboun, Lebanon.

contact with the agrofood women's cooperative in Aarsal and will be cooperating with them directly in processing wild fruits in the fall (2002);

- The project has signed a contract with the Aarsal Rural Development Association to establish a local wild fruit tree nursery that should produce thousands of seedlings of wild and local varieties of specific local trees. The project is providing the financial support for the initial establishment and some running costs as well as the technical support and training in seed collection, labeling, nursery practices and management (in cooperation with ACSAD experts). ARDA is providing the land, water and some labor. Seedlings produced will be used by the project for different purposes (reforestation, use as rootstocks, distribution, etc.);
- Training of farmers:
  1. Training of local NGOs and community members (more than 40 trainees) from target areas on *"Capacity building in community-based work and management of NGOs"*
  2. Training of more than 15 local community members from target areas on the *"Establishment and management of fruit tree nurseries using international expertise"*



Training of farmers on fruit tree nursery establishment and management of orchards.

3. Training of more than 30 farmers from target areas on *"Improved fruit tree production" using international experts*
4. Training of more than 40 bee-keepers from target areas on *"Improved apicultural techniques."* Training conducted jointly with the "Apiculture Protection Improvement Society - APIS."

## Demonstration of technical options for promoting rangeland agrobiodiversity conservation in the West Bank

Salah Al-Lahham, Younis Sbeih, Nawaf Attawneh and Ahmed Amri

### Introduction

The total area of rangelands in Palestine is estimated at 2,118,000 dunums. This represents approximately 33% of the total area of Palestine, and of this around 70% is located in one agro-ecological zone in the eastern slopes. Most of these areas are not accessible to local herders due to the prevailing political situation that puts high pressure on the remaining accessible grazing areas. This situation has caused severe degradation of land and rapid loss of local agrobiodiversity.

The project on "Conservation and Sustainable Use of Dryland Agrobiodiversity in West Asia," funded by the Global Environment Facility (GEF) and coordinated at the regional level by the International Center for Agricultural Research in the Dry Areas (ICARDA) is implemented by UNDP/PAPP (Program of Assistance to Palestinian People) and the Ministry of Agriculture in the Palestinian Authority, in two target areas, viz., Jenin and Hebron. The project aims at promoting community driven actions for rehabilitating and restoring native agrobiodiversity.

### Material and methods

This study reports the results of demonstration trials on technological options for the promotion of conservation of local agrobiodiversity in rangeland ecosystems.

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- **Study area**

Tayseer site is located in the southern part of the Jenin target area. Steeply dissected hills, plains and plateaus dominate the area. The annual average rainfall is above 350 mm. The cultivation of field crops and grazing on natural grasslands are the main agricultural activities. The church owns more than 90% of the land; therefore, most of the farmers rent the land for cultivation. The dominant tree species are olives, wild almonds and carob trees. Field crops include cereals and legumes. The areas that are used for grazing include high numbers of forage species. The predominant type of ownership is open communal lands and the local farmers are sedentary.

**Sair (Wadi alreem site)** is located in the northern part of the Hebron target area. The area is dominated by strongly dissected hills. The main agricultural activity is field crops and grazing of the natural grasslands. Wadi alreem is located in a semi-arid to arid zone with an average annual rainfall of 250 mm. The predominant land use is rangeland in the open communal land where people are mainly nomads. Twenty (1m<sup>2</sup>) square plots were distributed randomly inside and outside the demonstration site and used to estimate the total vegetation biomass and species composition.

**Daheria (Em aldahab site)** is located in the southern part of the Hebron target area. It is a hilly area that is dissected by plains and gentle sloping areas. The Daheria project site is also located in a semi-arid to arid zone with an average annual rainfall of less than 250 mm. Field crops and grazing in the rangelands are the main agricultural activities. Targeted species are landraces and wild relatives of cereals (barley) and forage species. The local community is semi-sedentary; the predominant land tenure is individual ownership.

- **Treatments**

The demonstration areas are 120, 87 and 97 dunums, respectively, for Tayseer, and Daheria. Shrub plantation within contour water harvesting structures were tested in all sites while phosphorous application was tested only at Tayseer. Fifteen to 20 plots of 1 m<sup>2</sup> were randomly selected inside and outside the demonstration sites to measure the impact of treatments on rangeland productivity and on species composition. At each plot, ground cover percentage of total vegetation, bare soil, rocks and litter coverage

were estimated and then species composition were recorded. All current year growth inside the plot was clipped to the soil surface, and placed in labeled paper bags. The fresh weight was recorded in the lab and oven dry weight also measured for each sample until it became stable. Then, average oven dry weight was calculated for all plots inside and outside the demonstration areas.

## Results and discussion

The data in showed that treatments tested resulted in increasing vegetation cover by 108.6, 11.8 and 3.6 percent respectively for Sair, Daheria and Tayseer sites. The dry biomass also increased significantly and respectively by 91.9, 95.5 and 12.5 percent. Tayseer had the highest dry biomass productivity although it had the highest percent of rocks.

The total number of plant species found in the treated plots are 50, 35 and 16 respectively for Daheria, Sair and Tayseer including 7, 6 and 11 of project targeted species. In Sair treated site, the first highest five plants were occupied by *Raphanus rostratus*, *Carthamus tenuis*, *Crithopsis delileana*, *Sinapis arvensis* and *Anthemis palestina*, while in Tayseer treated site the first highest five plants were occupied by *Trifolium 'clypeatum*, *Coronilla 'scorpioides*, *Onobrychis squarrosa*, *Trifolium stellatum* and *Avena sterilis*.

In general, the treated plots have more total and target species than the control plots. Tayseer had the highest number of target species that could be explained by the reseeding of some forage legume species. The target species found recorded in the survey plots within the treated areas are reported in Table 1.



Shrub plantation promoted with water harvesting techniques for rehabilitation of rangelands.

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**Table 1: Species composition and their relative frequencies in the treated plots in Sair, Tayseer and Daheria.**

Species name	Sair	Tayseer	Daheria
<i>Lathyrus blepharicarpus</i>		10	
<i>Medicago coronata</i>		10	
<i>Trifolium pillulare</i>		10	
<i>Trifolium purperium</i>		10	
<i>Aegilops peregrina</i>		40	
<i>Hordeum spontaneum</i>		40	
<i>Medicago 'polymorpha</i>		40	
<i>Vicia palaestina</i>		40	
<i>Medicago truncatula</i>		50	
<i>Trifolium clypeatum</i>		60	
<i>Trifolium stellatum</i>	10	70	
<i>Lathyrus gorgonei</i>			20
<i>Medicago orbicularis</i>			20
<i>Medicago tuberculata</i>			20
<i>Trifolium capestre</i>			60
<i>Medicago spp.</i>	10		
<i>Vicia sativa</i>	10		
<i>Vicia spp.</i>	10		
<i>Medicago radiata</i>	20		

## Conclusion

The tested technological packages demonstrated significant possibilities for improving the productivity and the species richness of rangelands. But, management of grazing is crucial in sustaining the benefits of rangelands to local communities and avoiding further loss of native agrobiodiversity and land degradation.

## Thesis abstracts

### *The Environmental Concepts of the Secondary School Student in Jenin City*

Abstract of Masters thesis by Ms Asma Abu Al-Roub under the supervision of Dr Hassan Abu Qaud from Al Najah University

This investigation was aimed at establishing environmental awareness concepts and making them available to educationalists and environmentalists.

More than 1600 students from high schools in Jenin district were questioned on various humanitarian

information, animal and plant sectors, natural resources, and pollution matters. Results of this study are as follows:

1. The awareness among students of the second secondary schools on environmental issues were found to be low to fair.
2. There were no significant differences in environmental awareness among the students of both sexes of this study.
3. Significant differences were found based on type of students residence and on the education level of the parents.

This study recommended that:

1. The educational curriculum must include environmental education.
2. It is also suggested that environmental awareness societies need to be established.
3. The media must acquire a role in improving the relationship of students and their habitats.

### *Comparative Study of Genetic Diversity in Durum Wheat in Palestine*

Abstract of Masters thesis by Ms Heba Mu'een Al Fares, under the supervision of Dr Hassan Abu Qau'd and Dr Sami Yaish

A total of 11 durum wheat varieties were grown in the green house to study morphological differences. Six landraces, three commercial cultivars, and two introduced cultivars from ICARDA were further analyzed to detect variations at DNA level using Randomly Amplified Polymorphic DNA (RAPD) technique. The following characteristics were studied: plant height, flag leaf length, and tillering capacity. Statistical analysis using one-way ANOVA test showed significant variability among varieties for tillering number, which ranged between 1 to 3 tiller per plant. However, there was non-significant variability among varieties in plant height and flag leaf length.

For DNA genetic variation, a genetic similarity matrix based on the dice coefficients was constructed using RAPD data to assess the genetic relatedness. The mean similarity indices presented by the 11 varieties ranged from 0.10 to 0.81 for all varieties with an average of 0.40. The wide range of similarity indices indicated that a wide range DNA polymorphism occurring among the 11 varieties. The results allowed the clustering of the varieties, but no clustering related to collection site was detected. With the 11 vari-

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eties used, there were 159 RAPD markers produced by five primers. This analysis has proven that RAPD-PCR is a useful tool to determine genetic diversity among durum wheat varieties and can provide valuable information for the management and identification of genetic resources.

## Main activities

### Jordan Component

1. The project has helped two local NGOs in Ajloun obtain GEF grants on activities promoting agrobiodiversity conservation. The first agreement is with the Princess Basma Center at Wahadneh for an amount of US\$ 28,000 to support the rehabilitation of 45 dunums of natural habitats. The second is with the Arjan Charitable Association for an amount of US\$ 42,000;
2. The project participated in Ajloun celebration of "Arbor Day" held under the patronage of Ajloun Governor on 20 January 2003 at the garden of Ebeen Municipality. The attendees planted target species such as wild almond and wild pear in the garden that is planned to be a park for the local community. A similar activity was held in collaboration with Jordan Environment Society (JES) at JES's land at Tabarbour. The area will be used as field genebank to preserve old trees and wild fruit trees threatened by urbanization;



*Participation of students in reforestation efforts in Tabarbour, Jordan.*

3. The project is helping to create two field genebanks: one at the Jordan University for Science and Technology (JUST) where wild fruit trees will be planted and the regeneration of natural herbaceous species will be enhanced through water harvesting techniques. The second at Kufur Khal forest where water harvesting semi-circular structures are used to preserve the wild almond, pears, *Crateagus*, *Arbutus* and *Quercus* species. Both sites will serve for education purposes to conduct thesis work on management of natural habitats;

4. The Project Manager was invited by the Business and Professional Women Club to talk about the importance of agrobiodiversity conservation and the benefits it can provide to improve the livelihoods of rural women. More than 30 women attended the workshop;
5. Three training courses were organized in cooperation with Ajloun Agricultural Directorate for the benefit of farmers. The first one on principles of pruning fruit trees and the importance of pest control was held at Ebeen for 11 farmers. The second was on how to train the grape vines for 13 farmers, and the third was on Oyster mushroom production provided to more than 13 women of Al-Jabal Al-Akhdar. This last training course was also provided to 14 women from Sakhra village;



*Mushroom production has been initiated by local communities in Ajloun, Jordan for the diversification of their income.*

6. Within its extra-curricula activities to promote biodiversity conservation at schools, a musical play for kids based on a story entitled "Unhappy Flower" was performed at Shmaisani Al-Gharbee School;
7. The project hosted Miss Lubna Senan as a part of UNDP-external internship program. She started her work with the project on 1 April 2003 to draw grazing routes using GIS and assess different factors of degradation of rangelands in the target areas;

### Lebanon Component

1. Seeds of 8 *Trifolium* species, 5 *Medicago* species and *Vicia cuspidate* and seeds of *Crateagus azarolus* and *Crateagus aronia* collected the previous summer, from Nabha and Aarsal sites were planted at LARI's Tal Amara station and at the nursery of Aarsal Rural Development Association (ARDA) respectively for seed increase and production of plantlets for rehabilitation of degraded rangelands and natural habitats;
2. Welcome to Dr Raghed Assi as the new Project Manager and Ms Denise Dahrouj as project administrative assistant;
3. An area of more than 4 hectares was selected in

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*New project team in Lebanon.*

the project site of Nabha for demonstration of rangeland improvement packages. Contour ridges were established. The area was then divided into 4 plots with 4 different treatments: one was seeded with native legumes (rate of the mixture of the native species is 12 kg/ha) and had  $P_2O_5$  application (30 kg/ha); another plot was seeded but without  $P_2O_5$  application; a third one was not seeded but had  $P_2O_5$  application and the last one was neither seeded nor fertilized. Seeds of native legumes were provided by ICARDA station in Terbol;

4. Mr Hiam Mallat, the national legal expert, submitted the final report on the development of a proposal for the establishment of a national plant genetic resources program in Lebanon;
5. The Agrobiodiversity Committee was established at LARI and held several meetings to discuss the full participation of LARI staff in the implementation of project activities which will ensure the sustainability of project goals and actions;
6. Three hundred seedlings of local varieties of fruit trees (150 apricots, 100 cherries and 50 pears) were planted in an orchard at Nabha-Kalile in the site where water harvesting contour stone-walls were established;
7. A student, Mr Farid Abdallah, working with Dr Leila Jaajaa is partially supported by the project to conduct his field research on the "Evaluation of wheat landraces mixtures on yellow rust progress under field conditions."
8. The website describing the activities and achievements of the project in Lebanon was launched. The URL is: [www.lari.gov.lb/agrobio](http://www.lari.gov.lb/agrobio)
9. An area of about 8 ha at Aarsal project site (Jewar El-Cheeh) was planted with around 3000

seedlings in a joint effort between the Agrobiodiversity Project, GTZ-CoDeL project, and ARDA for promoting the use of native fruit trees in reforestation efforts. Seedlings of wild almond, wild pear and wild pistachio, originally collected by the project as seeds and increased by ARDA nursery, were used;

10. The project organized a five-day training course at LARI station, Tel Amara, for 9 participants on "GIS Application for the Management of Natural Habitat and Agrobiodiversity" for the project and LARI staff. Another training was provided to more than 25 farmers and representatives of NGOs on production of quality seeds of cereals and legumes. Both training sessions were provided by ICARDA experts;
11. The Agrobiodiversity Project in Lebanon participated in the exhibition at the Phoenicia Hotel in Beirut on the occasion of the World Environment Day that was hosted by Lebanon this year (June 5, 2003). The Agrobiodiversity stand was visited by the Lebanese Minister of Environment, the DG of UNEP, the Personal Representative of the UN Secretary General in Lebanon and other delegations.

### *Palestinian Component*

1. Around 30 dunums at Tayseer target site were planted with *Atriplex* spp., *Ficus indica* and wild almonds. More than 4500 seedlings were distributed in Tayseer and Deir Abu Deif target sites to farmers and local community who planted them in schools, public areas and near open roads in the villages and 2000 seedlings of these trees were distributed to 7 target farmers in Sair.
2. The project team conducted a training course on apiculture for 25 women in Tayseer target site. In addition and in close cooperation with the Palestinian NGO "Palestinian Agricultural Relief Committee (PARC)" the same course was conducted for 22 women in Deir Abu Deif target site. H.E. Mr Rafiq Al-Natsheh, Minister of Agriculture, distributed certificates to the participants. A training on compost production for home gardening was conducted for the benefit of 40 women from Tayseer;
3. For the purpose of introducing medicinal plants into the farming systems, the project team distributed around 80,000 medicinal plants (such as thyme and chamomile) to benefit around 120 families from the project target sites;
4. The agrobiodiversity policy and legislation report,

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The project distributed large numbers of medicinal plants to women.

developed through the international experts Dr Jad Isaac and Dr Kamal Quba'a, was reviewed by the Ministry of Agriculture, UNDP, and ICARDA and an executive summary will be presented to the government;

5. In cooperation with An-Najah National University, the project staff conducted a workshop for 50 women in Tayseer project target site. The workshop focused on women's role in conserving agrobiodiversity, management of home gardens and compost formation, seed storage, etc. Another set of farmer's workshops were held in Tayseer and Deir Abu Deif project sites in cooperation with Tubas and Jenin Departments of Agriculture. More than 75 farmers attended the workshops that focused on the importance of local varieties and the means to enhance community seed production.

### Syrian Component

1. The project, in collaboration with the Forestry Department, started its rehabilitation efforts in the mountainous areas of Lattakia province by reforesting Al-Shardoub site (25 Dunums) and Al Mehweyeh (5 dunums) with landraces and wild relative of native species (apricot, crateagus, pear, figs, olives, zyziphus, apples, etc.). The seedlings were produced by a private agrobiodiversity nursery supported by the project. These sites will also serve as *in situ* conservation and a field genebank of local agrobiodiversity. Another field genebank of 6 dunums was created at Bouka Research Center (Lattakia) to conserve 48 varieties and wild relatives of fruit trees collected from the region;
2. Al-Hannady nursery of the Forestry Department is multiplying more than 40,000 seedlings and cut-

tings of landraces and wild relatives of fruit trees (figs, plum, apricot, olive, creteagus, zyziphus, rhus,). More than 7000 were distributed to 18 collaborating farmers.

3. A traveling workshop for herders collaborating with the project from Mushanaf, Rushaideh, Isaana target areas was organized for the Al-Bab project for rangeland rehabilitation and Tel Hadya station (ICARDA - Aleppo to sheep unit, genebank rangeland bushes, water harvesting);



Reforestation with native species in Lattakia, Syria.

4. A contract was signed between Agrobiodiversity Project and Ministry of Education to speed up the introduction of agrobiodiversity concepts into school curricula. A separate contract was signed with Dr Suleiman Al-Khatib (education expert) to prepare a study on "Environmental Education and its Role in Establishing Values and Conducts for Youth to Participate in the Conservation of Agrobiodiversity";
5. A training course on apiculture, focusing on improvement of local races of honey bees in Syria, was organized at Sweida on 11-16 May 2003 for the benefit of 20 farmers and technicians;
6. A traveling workshop on participatory breeding was organized for 17 farmers and technicians who visited ICARDA trials on barley participatory breeding and participated in the selection among cereal and legume lines and landraces;
7. Within the public awareness activities and in collaboration with Directorate of extension, the rural theatre gave two performances in Al-Haffeh and Shrifia in Lattakia and two performances at Al-Mushannaf and Sahwat Al-Khodr in Sweida. A total of 550 people attended the play.

### Regional Component

1. Dr Amri participated in the workshop on Post-Harvest Techniques organized by FAO/AARINE-NA/ NCARTT held in Amman on 6-8 January 2003 and the workshop on Sustainable Livelihood Approach organized by IFAD in Amman on 12-17 January 2003;

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2. The second thematic meeting on “Introduction of biodiversity conservation within education programs”, organized by the Regional Component of the GEF-UNDP dryland agrobiodiversity, was held at the headquarters of the General Commission for Scientific Agricultural Research (GCSAR) at Douma, Syria, on 19-20 February 2003. Dr Majd Jamal, the DG of GCSAR and Dr Suleiman Al-Khatib, the Deputy Minister for Education in Syria welcomed the participants and reiterated the commitment of the Syrian government and project team to join efforts with project teams in other countries to harmonize the activities of introducing biodiversity conservation in the education systems. The national consultants presented the progress made to date including the list of biodiversity concepts to be included at different education levels. After ample discussion it was recommended to:
  - Develop, by each national component, the matrix of concepts using the common agreed areas (environment and eco-systems, biological diversity, agricultural diversity and sustainable development, role of local communities, and regional and international cooperation);
  - Develop the teacher’s guide (educational guide or concept’s guide) by the national education consultants;
  - Develop, by national components, a methodology guide which includes ways and activities (including extra curricula activities) that will help teachers transmit the knowledge and behavior of conserving biodiversity to students;
  - Develop, by the regional component, a scientific biodiversity guide that can be used by national components as the basis for the development of simplified definitions of main biodiversity concepts and terminology.
3. ICARDA’s Genetic Resources Unit and the GEF-UNDP Agrobiodiversity Project organized a regional training course at the headquarters on 23 February–6 March 2003 on “Use of DNA Molecular Tools for Biodiversity Studies.” This course was attended by two participants from Palestine and one each from Jordan, Lebanon and Syria, in addition to participants from Algeria, Pakistan, and Uzbekistan;
4. Dr Jabbarin, socioeconomist from Jordan, presented, on behalf of the Regional Component, the policy framework and the experience of the Dryland Agrobiodiversity Project for the development of national policies and legislation to conserve agrobiodiversity during the workshop on “Policy and Legislation in Relation to On-Farm Conservation of Crop Genetic Diversity” organized by the IPGRI’s Global *In Situ* Conservation Project in Marrakesh, Morocco on 24-27 February 2003.
5. The Dryland Agrobiodiversity Project organized a regional training on “Rangeland and Livestock Management” at ICARDA’s office in Amman, Jordan on 2-5 March 2003. A total of nine participants (4 from Jordan, 2 from Lebanon, 1 from Palestine and 2 from Syria) attended the session. Project Managers from Jordan, Lebanon and Syria and the national rangeland experts from Jordan and Syria also participated in the discussions. This course covered areas and options that allow the promotion of conservation of local agrobiodiversity through rangeland and livestock management. Dr Amri presented the importance of rangelands improvement and rehabilitation in *in situ* conservation of agrobiodiversity and Mr Shehadeh presented an eco-geographic survey methodology. Dr Abu Zanat presented the technological options for rangeland improvement and rehabilitation and the results of the feeding and grazing surveys conducted by the project components. Dr Rihawi and Mr Ghassali from ICARDA presented feed alternatives (feed blocks, treated straw and silage techniques) and shrub plantations (*Atriplex* and alley cropping technologies) respectively. Dr Oweis, the senior water specialist at ICARDA, talked about the principles of water harvesting and the relevant techniques for rangelands. Mr Atef presented examples of water harvesting techniques in rangeland rehabilitation used by the project in Sweida region. Mr Shomo from ICARDA presented the use of STAT package in analyzing rangeland survey data and in developing feeding calendars. Mr Shehadeh illustrated the use of GIS tools in assessing and monitoring rangelands. Dr Al Doumi talked about the major diseases of small ruminants in the region and about the Jordanian experience in Para-vet services. Dr Abu Swai presented the results of rangeland activities of the Mashreq



Participants at the regional training on rangeland and livestock management.

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*Participants at the training on management of natural habitats.*

and Maghreb project in Jordan. On 3 March 2003, the participants visited Khanasreh experiment station to see feed block and urea treatment technologies presented by Dr Rihawi;

- The 3<sup>rd</sup> rangeland thematic meeting followed the training course on 6 March 2003 and was attended by the national rangeland experts, Project Managers, Regional Coordinator and Mr Shehadeh, Mr Shomo, and Mr Ghassali from ICARDA. During this meeting, the progress in implementing project activities and the methodologies for assessing and monitoring rangeland status and the effects of project activities on agro-



*H.E. Mahmoud Duwayri, former Minister of Agriculture in Jordan, participated in the collection of wild *Triticum* species.*

biodiversity were presented. The rangeland management options (reseeding of native range species, plantations of shrubs mainly *Atriplex* and *Salsola* alone or in alley cropping with barley, introduction of legume forages within the fruit tree orchards and in rotation with cereals, and the application of  $P_2O_5$ ) were tested in combination with water harvesting techniques at large scale, in some cases reaching more than 500 dunums. Dr Amri stressed the importance of providing in-kind incentives to collaborating herder communities in the form of feed block units and veterinary services to help test grazing options. The group agreed to use the form developed by the project for assessing the effects of different technologies

tested on rangeland diversity. The indicators for assessing the general range condition were developed.

- A regional workshop on natural habitats management, guided by Dr Nigel Maxted was organized on 23-25 May 2003 at ICARDA-headquarters in Aleppo, Syria for the benefit of 12 participants (4 from Jordan, 4 from Syria, 1 from Palestine and 3 from Syria in addition to two participants from the Royal Society for Conservation of Nature in Jordan). Lectures mainly covered the clarification of the definitions of different natural habitats and the methodologies for establishing management plans. Two days of field-work at Al Haffa allowed the participants to apply their knowledge on management plans. The participants attended the second workshop on eco-geographic database management (28-29 May 2003) where Mr Jan Konopka explained the use of the project-developed program for eco-geographic and botanic surveys. Prof. Sakti Jana from the University of Saskatchewan attended the workshop and expressed his willingness to collaborate in the future. The Regional Component organized a traveling workshop on participatory barley breeding for the benefit of 12 farmers from the project sites. The group visited the trials in farmers' fields and at ICARDA station in Tel Hadya with Dr Ceccarelli and participated in the selection process with other farmers.
- A training course on "Intellectual Property (IP) Management in Agriculture, held at ICARDA, Aleppo, was conducted by Dr John Dodds on 23-25 June 2003. All project managers attended the training. The course was a combination of lectures and group sessions;
- Dr Mahmoud Al-Duwayri, along with Dr Ahmed Amri, Dr Mohamed Ajlouni and Mr Nabih Al Kayed, participated in the collection mission for *Triticum dicoccoides* species in the southern parts of Jordan. More than 15 populations along with several landraces of barley and durum wheat were collected. High degree of natural hybridization was found between wild *Triticum* and a landrace of durum wheat in Tafila region. Single plants were collected to study the gene flow.

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## معرض التنوع الحيوي الزراعي في مهرجان الخس – أرتاس

16-6 نيسان 2003

بقلم المهندس هيثم الحسا سنة

على أصولها وثرواتها. ومن هذا المنطلق كانت مشاركة المشروع لتبنيان التراث النباتي والثروة النباتية التي تمتاز بها فلسطين. ففي صبيحة يوم السادس من نيسان/أبريل 2003 افتتح معالي وزير الزراعة السيد رفيق النتشة والممثل الخاص لبرنامج الأمم المتحدة – القدس/ تيموثي رذرميل ولفيف من القياديين والمهتمين بالمحافظة على الثروة النباتية هذا المهرجان، مؤكداً على التواصل و الدعم المستمر للمحافظة على البيئة و تأمين الجو المثالي لنمو أجيالنا القادمة.



لقد كان معرض التنوع الحيوي من المعارض التي استحوذت على اهتمام الجمهور، فقد

اشتمل المعرض على عدة أقسام عدة من قبيل قسم يعرض التنوع الحيوي الزراعي في عيون الأطفال متمثلة في منتوجات أندية التنوع الحيوي الزراعي التي أنشأها المشروع في المدارس المختلفة من رسومات الأطفال و أعمالهم اليدوية و كتاباتهم المتخصصة بأرائهم للمحافظة على التنوع الحيوي الزراعي. وقداستحوذ على اهتمام الزوار صندوق خشبي يبين طرق حفظ الأطعمة بالتجفيف والحفظ بالتسكير والحفظ بالتمليح. وقسم يعرض منشورات المشروع من الدراسة الاقتصادية- الاجتماعية والوصف للقري المستهدفة



أحد موظفي المشروع يشرح للوزير عن نتاج أندية التنوع الحيوي الزراعي

دير أرتاس حيث انطلق المهرجان

تقع قرية أرتاس جنوبي بيت لحم (15 دقيقة سيرا على الأقدام) واسمها مشتق من الاسم اللاتيني *Artasium* الذي يعني الجنة المقلدة، وهي بحق جنة ذات تنوع نباتي و طبوغرافي عالي. فارتاس هي عبارة عن وادي بين جبلين، سكنه الناس من الجهة الشمالية للوادي وبقي الوادي لزراعة الخضار، أما الجهة الجنوبية للوادي فهي عبارة عن حراج ومنطقة مراعي لأغنام القرية.

تشتهر أرتاس بعيون الماء الكثيرة مثل عين أرتاس و عين صالح و عين البرج و عين البرك و عين الفروجة. ولذلك تسود الزراعة المروية فيها منذ نشأة القرية. وهناك برك سليمان المؤلفة من ثلاثة برك، لا يعرف متى بنيت الأولى والثانية منها ولكن بنيت الثالثة سنة 1460 في عهد الظاهر خشدان وهذه البرك بنيت لكي تخزن ماء العين بالإضافة لمياه الأمطار لكي تزود منطقة القدس بالمياه و تعتبر من أكبر تجمعات البرك التي تستخدم للحصاد المائي في المنطقة.

من أشهر منتوجات أرتاس الزراعية الخس و لذلك أطلق على المهرجان اسم مهرجان الخس ولكن ليس المقصود الخس بذاته بل تراث أرتاس الثقافي والنباتي والخبرة المتوارثة التي أبقت هذه القرية و أمدتها بالقوة لتبقى صامدة في وجه تقلبات الزمان ولتحافظ

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المتأصلة في فلسطين. كما تم عرض النباتات الطبية التي تبني المشروع توزيعها مثل الزعتر والميرمية والقرنية وغيرها ولاننسى المعشبة التي جمعت بأيدي موظفي المشروع وأيضا عينات من البذور المحلية من قمح وشعير وعدس وبيقية وكرسنة التي تم توزيعها على المزارعين بهدف اكثارها.

بقي أن نقول أن الإقبال كان جيدا على المعرض لاسيما من طلاب المدارس من كافة الأعمار بالرغم من الإغلاقات الإسرائيلية. فقد وصل عدد المدارس ما يقارب الخمسة وعشرين مدرسة ما بين حكومية وخاصة معظمها من محافظة بيت لحم، وقد أبدى الطلاب ومعلموهم الاهتمام الكبير في تبني فكرة أندية التنوع الحيوي الزراعي.

### المزارع النشيط

#### بقلم المهندس بثينة مزياد

ولد تحسين جابر ' أبو موسى ' في قرية تياسير ونشأ وترعرع في ربوع القرية على مدى اثنين وأربعين عاما، هذه القرية الأثرية الهادئة التي تحيط بها الجبال من جميع الجهات تقريبا وتطل عليها من أعالي بعض الجبال نقاط مراقبة أثرية قديمة ويعبر منها الطريق القديم الذي يربط بيسان وشمال فلسطين والشام مع نابلس وطولكرم وتضم تربتها أثار الحضارات القديمة من كنعانية وبيزنطية ورومانية وغيرها وبها بعض أثار معاصر الزيتون مما يدل على أنها قرية زراعية قديمة

حيث تقع قرية تياسير إلى الشمال الشرقي من مدينة طوباس، من الحدود الجنوبية الشرقية للسفوح شبه القاحلة حيث يتراوح معدل سقوط الأمطار فيها ما بين 300 - 350 ملم سنويا، حيث أن القرية محاطة تقريبا من جميع الجهات بالأراضي التابعة لمدينة طوباس علما بأن مساحة الأراضي المملوكة من قبل السكان المحليين تبلغ 1000 دونم، وهو ما يمثل 4.5% من إجمالي الأراضي التي تصل إلى 23000 دونم. أما القسم المتبقي فهو ملك للبطيركية حيث يُستثمر جزء منه للزراعة والجزء الأكبر للرعي. كما تم مصادرة قسم كبير من أراضي الرعي من قبل الجيش الإسرائيلي لأغراض عسكرية.

والمزارع تحسين جابر ' أبو موسى ' من المزارعين النشطين في القرية والمستهدفين من قبل مشروع التنوع الحيوي الزراعي، حيث يمارس



زيارة الطلاب تبدأ من برك سليمان وتنتهي بمعرض التنوع الحيوي الزراعي

والحصاد المائي ونشرة عن المشروع والمواد التدريبية للمعلمين وللنساء بالإضافة للملصقات الخاصة بالمشروع والملابس الدعائية. وأخرى تعرض منتوجات الأندية النسوية من مربيات ومخللات وحبوب ومنتوجات تصنع من الأصناف المحلية البلدية. وقد قامت إحدى السيدات بصناعة نموذج مصغر من الطابون (يستخدم لصناعة الخبز) والرحى (يستخدم لطحن القمح) والموقدة (يستخدم لوضع الفحم). ومما اثار اعجاب الجمهور لوحة جدار لسيدة في الستين رسمت وكتبت فيها بشكل بسيط تخيلاتها و آراءها للمحافظة على الزراعة القديمة.

وأیضا كان هناك ركن لعرض الأشجار الحراجية المتكيفة والخاصة بفلسطين مثل البطم الفلسطيني والخروب والبلوط والإجاص البري وغيرها وجميعها من إنتاج المشاتل الحراجية الحكومية التي باتت تتعامل وتأخذ بإرشادات المشروع في اكثار النباتات الحرجية



النظرات توحى بالاهتمام والرضا

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أبو موسى يقوم بنثر السماد في مشاهدة المراعي التي قام المشروع بإجرائها في أرضه



أبو موسى يعمل في حقله بتنظيف محصول البصل من الأعشاب

الدراسة الاقتصادية-الاجتماعية التي قام المشروع بإعدادها، فقد أدرك منذ بداية المشروع المعنى الحقيقي للحفاظ على التنوع الحيوي الزراعي ومدى أهمية وملاءمة الأصناف البلدية لبيئة المنطقة التي تعيش فيها، حيث كان من أوائل المزارعين الذين قاموا بزراعة الأصناف البلدية في أرضه مثل القمح البلدي وأصناف البصل البلدي وغيرها من الأصناف المحلية المستهدفة بالمشروع وذلك للمساعدة في نشر فكرة إعادة زراعة هذه الأصناف في حقول المزارعين مرة أخرى، ولثقة المزارعين به فقد كان إقبال المزارعين في القرية على إعادة زراعتها واضحاً.

هذا وقد ما يقارب الثلاثون دونماً من أرضه، من أجل زراعتها بالنباتات الرعوية كمشاهدة وتم رشها بالسماد الفوسفاتي، كما تم عمل مشاهدة للحصاد المائي فيها حيث تم زراعتها بالصبار واللوز المر وبعض النباتات الرعوية الأخرى.

وقد أرسيت أسس علاقة وطيدة بين فريق المشروع وأبو موسى، فهو يعتبره من أهم المشاريع المنفذة في المنطقة لأهميته في إعادة زراعة الأصناف القديمة المتكيفة مع البيئة والذي لعب الاحتلال دوراً رئيسياً في اختفائها من خلال الشركات الإسرائيلية التي أدخلت الكثير من الأصناف غير الملائمة لطبيعة المنطقة ومناخها مما أدى إلى تدهور الزراعة بشكل كبير. من هنا كانت أهمية هذا المشروع وعمله على إعادة زراعة هذه الأصناف المحلية القديمة سواء أكانت محاصيل حقلية أم شجرية، فهو يذكر كيف كانت ارض عائلته مزروعة بالعنب والتين والرمان واللوزيات التي يعمل الآن على إعادة زراعتها مجدداً.

الزراعة منذ طفولته، وهو أب لعشرة أفراد. ورغم إصابته بالعديد من الأمراض، إلا انه لا يزال يقوم بأعمال زراعية متنوعة من أجل توفير متطلبات الحياة لعائلته، كالحرثة بالأجرة والإشراف على أرض البطر كيه بالإضافة إلى انه يملك ما يقارب المائتي دونم يقوم بزراعتها.

كما يعتبر أبو موسى خبيراً في مجال الزراعة، خاصة الزراعة البعلية، وهو نمط الزراعة السائد في القرية نتيجة شح المياه، إذ اكتسب هذه الخبرة الواسعة من والديه.

والزراعة تعتبر مصدر الدخل الرئيسي في حياته فهو يزرع القمح والشعير والبصل والزيتون وغيرها من الزراعات البعلية، وقد قام بنقل جزء كبير من خبرته لابنه الكبير موسى الذي يقوم بمساعدته في جميع الأعمال الزراعية التي يقوم بها، كما أن أم موسى في فترة الربيع تقوم بجمع بعض النباتات البرية ذات القيمة الغذائية التي تنمو في المنطقة مثل الخبيزه والزعمطوط واللسينه والتي تستخدمها في تغذية أبنائها.

وتعتبر أم موسى أيضاً من المزارعات اللواتي استهدفن مشروع التنوع الحيوي الزراعي فقد حصلت على بعض النباتات الطبية مثل البابونج والزعرير والميرمية التي تم توزيعها على عدد من المزارعات في القرية.

كما أن عمل أبو موسى كمشرف على ارض البطر كيه أكسبه المعرفة والخبرة بجميع المزارعين، لذلك فقد كان له دور مميز في إعداد