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## CGIAR Collaborative Research Program for Sustainable Agricultural Development in Central Asia and the Caucasus



CGIAR Collaborative Research Program for Sustainable Agricultural Development in Central Asia and the Caucasus is being implemented in the region since 1998. The goal of the Program is to contribute to achieving the overall goal of food security, economic growth, environmental sustainability and poverty alleviation in the countries of Central Asia and the Caucasus. Its immediate objective is to assist the CAC countries in achieving sustainable increases in the productivity of crop and livestock systems through development, adoption and transfer of production technologies, natural resource management and conservation strategies, by strengthening agricultural research and fostering cooperation among the CAC countries and international agricultural research centers.

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# EDITORIAL

Transferring knowledge and making it more easily available and accessible, doing research on the ground and putting it into action lie at the core of the efforts by the International Agricultural Research Centers working together as a regional consortium in Central Asia and the Caucasus.

The Centers continue to maintain their focus on the rural populations as they are most prone to any falls in crop and livestock production. We work together with local researchers and other partners in order to assist farmers in learning and adapting to climate change and other environmental constraints.

Wheat as the main food security crop forms a good part of our collaborative research efforts. Identifying and developing varieties resistant to heat, drought, salinity and diseases is particularly important.

During a recently completed two-year study in Uzbekistan (p. 3), ICARDA researchers and their local counterparts have been able to find high-yielding, heat-tolerant varieties with the aid of advanced technology that identifies potential yield on the basis of measuring the health of green tissues. Another research (pp. 3-4) has produced promising results in the search for wheat lines that can withstand yellow rust, a big risk for wheat production in the region, especially with unstable and changing climate conditions. Not only do new wheat varieties fare better against the pathogen, but they yield more too. Seeds of a few such lines are currently being multiplied on an area of 126 ha in Uzbekistan and Tajikistan.

To build on the success of these two studies, a new project running until 2015 (pp. 6-7) is now under way to test how tolerant facultative wheat varieties are to heat stress at the flowering stage.

In addition to leading research, the consortium also acts as a bridge between researchers from the region and their peers from international organizations and other countries. Most importantly, it fosters cooperation. Conferences and meetings serve as a platform for face-to-face discussions, exchanges of opinions, experience, and above all finding solutions. For example, a conference in October 2012 (pp. 13-14), organized by the World Meteorological Organization (WMO), the Association of Agricultural Research Institutions in Central Asia and the Caucasus (ACAARI), the Food and Agriculture Organization (FAO) of the United Nations, ICARDA and the Global Forum for Agricultural Research (GFAR), convened to find ways of establishing improved links between government agencies, researchers and farmers, and work out a comprehensive and integrated approach to planning and implementing climate change adaptation strategies. Another in a series of regional meetings, held in December 2012 (pp. 15-16), looked at how best to overcome constraints to vegetable production in Central Asia and the Caucasus, which is still seasonal by and large.

Together with its national partners, the consortium also trains research and farming communities and provides necessary equipment. The activities range from promoting best practices such as conservation agriculture (pp. 17-19) and preventing land degradation and increasing crop productivity (pp. 20-21) to offering training in advanced research and technologies such as crop modeling applications (pp. 19-20) and high quality wheat seed production (pp. 21-22).

Improving water management practices in the region is also high on the capacity-building agenda. For instance, with financial support from the Swiss Agency for Development and Cooperation (SDC), the International Water Management Institute (IWMI) and its partners have been implementing the project Water Productivity Improvement at Plot Level (WPI-PL) in the Fergana Valley since 2008 (pp. 16-17). This project aims to enhance water productivity and increase crop yields at plot level through improved on-farm/on-plot water management.

But the Centers' joint efforts do not stop there. In the past few years, we and other international organizations have also worked with national media outlets to raise public awareness about sustainable agriculture and conservation. The rise of ecological journalism in Uzbekistan (pp. 24-26) can be viewed as an upshot of this joint endeavour. There is now a growing number of Uzbek journalists covering environmental issues, and there are more reports on the subject on TV, radio and in print.

All this is sure to facilitate the development of actions to tackle existing and emerging environmental challenges in the Central Asian and Caucasus region. And the Centers working together as the Regional Program are committed to helping countries achieve a sustainable agricultural and environmental future.

**Dr Jozef Turok,  
Head of CGIAR-CAC Program Facilitation Unit,  
ICARDA Regional Coordinator**

# RESEARCH HIGHLIGHTS

## Cooperation on groundnut in Uzbekistan bears fruits

Groundnut (*Arachis hypogaea* L.) is an annual legume native to South America. More than 100 countries in the world grow groundnut on a significant scale, with average productivity of 1.3 t/ha. Groundnut seeds contain about 45-50% oil and 30% protein. They provide a rich source of minerals (Ca, Mg, P, K, Fe) and vitamins. About two-thirds of world groundnut production is crushed for cooking oil. The remaining one-third is used in the form of edible products (boiled, roasted, fried, or as ingredients in others foods). In Uzbekistan groundnut occupies about seven thousand hectares.



*Scientists from Central Asia and the Causasus region are visiting groundnut research field of the Tashkent State Agrarian University. Photo by Sherzod Qosimov.*

Uzbek Research Institute of Plant Industry (UzRIPI) has tested accessions of groundnut received from the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT). Early-maturing, high yielding and large seed accessions were selected out of 28 entries, received from ICRISAT. This work resulted in the release of two varieties of groundnut, namely 'Salomat' and 'Mumtoz'. Both varieties occupy a large area in Uzbekistan. The variety 'Mumtoz' is recommended for planting as main crop and 'Salomat' is grown both as main and as second crop in the south of the country (Kashkadarya and Surkhandarya regions).

Currently, the variety of groundnut 'Tashkent-112' (released in 1945) belonging to the group Valencia, and the variety Kibray-4' of the group Virginia are also being cultivated in Uzbekistan. Both were developed at UzRIPI. 'Kibray-4' was released in 2000, and is a very high-yielding (3-3.4 t/ha) and large-seed variety (100 seeds weight is 80 g). However, this variety is not widely used due to the pink color of seeds and hard seed cover. Mid-maturing, average yield and red seeds characterize the variety 'Tashkent-112'. This variety is highly demanded in the market and, therefore, widely cultivated.

Owing to the overall transition to market economy and reduction of cropping area under cotton, cottonseed oil production declined. Cottonseed oil has been used in the local cuisine, especially in rural areas. Therefore, during the past few years, attention has been given to other oil-bearing crops. Efforts are being undertaken to introduce new technologies for oilseed crops processing, in order to increase the production of vegetable oil products in the country. The interest in groundnut and other oil-bearing crops increased significantly, even if cotton and grain crops (wheat) cover the majority of the cropping area. The task of research is to develop early maturing, high yielding groundnut varieties with high oil content.

According to widely available sources ([www.regnum.ru](http://www.regnum.ru)), farmers of Uzbekistan annually export more than 6,100 tons of groundnut to Russia. According to the Food and Agriculture Organization (FAO), the Uzbek farmers annually produce about 7,500 tons of groundnuts. Hence a very high proportion of the total groundnut production is exported. The main market for Uzbekistan's groundnut is Russia (90%). The share of groundnut in Uzbekistan's export market of dry fruits is more than 17%.

In Uzbekistan, the private sector accounts for the bulk amount (almost 99%) of groundnut production. According to experts, there are good conditions to further increase the area under groundnut cultivation in the country.

The groundnut accessions from ICRISAT were also tested in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan and Tajikistan. ICRISAT has been operating in Central Asia and the Caucasus (CAC) in the framework of the Consultative Group on International Agricultural Research (CGIAR) Program for Sustainable Agricultural Development. Building upon the achievements made in Uzbekistan, efforts will continue with monitoring and facilitating research on groundnut in other countries of the CAC Region.

## Technology to aid in finding heat-tolerant wheat in Central Asia

Heat stress is an emerging problem in Central Asia. If it occurs when grains fill, it can be an important constraint to wheat production and result in lower yields. With climate change here to stay, this problem is likely to grow bigger. And the need for heat-tolerant wheat lines is set to rise high on the agricultural development agenda. Developing heat-tolerant, high-yielding wheat varieties remains an important objective of winter wheat improvement programs in Central Asia. But identifying better lines requires technological and other resources. Traditional research in the region has relied mainly on selecting lines based on their yields. Such selection results in slower response rates though. So it is important to consider alternative traits that could be used as an indirect selection criterion to improve wheat grain yield. And GreenSeeker does just that. It allows determining the health of green tissues in plants and thus aids in identifying potential yield. In view of this, a group of researchers in Uzbekistan in collaboration with scientists of the International Center for Agricultural Research in the Dry Areas (ICARDA) in Tashkent set out on an experiment to examine if GreenSeeker can be used to screen wheat varieties tolerant to heat occurring during grain-filling. In the study that spanned over two years at two sites (Karshi and Kibray, Uzbekistan), the researchers have reported encouraging findings. The researchers have identified high-yielding, heat-tolerant varieties. The results of this research have far-reaching implications for developing heat-tolerant wheat varieties, also applicable to other crops. The study has been published in *Plant Breeding* (Vol. 137, pp. 716-721, 2012) journal.



*Researchers in Central Asia work to find heat-tolerant wheat lines. Photo by Sherzod Qosimov.*

## Yellow rust-resistant wheat to boost food security in Central Asia

Yellow rust, a disease affecting wheat, remains a serious problem in Central and West Asia. Finding wheat that is both resistant to the pathogen and can bring in good harvests is a daunting task. It has been a focus of winter wheat improvement programs in Central and West Asia for the past several years. Studies show that yellow rust has been the most severe constraint to winter wheat production in the region over the last 12 years. Central Asia alone has seen five disease outbreaks since 1999. In a study on global incidence of wheat rusts over the past 40 years, Morgounov et al. (2012) report epidemic levels of yellow rust between 2001 and 2010 in Central and West Asia, leading to substantial losses throughout the region. Adding to the problem is the cost of fungicides widely used to control the disease. Previous research had attempted to solve the problem but couldn't successfully combine resistance with the required level of productivity in new varieties. Recent research, however, appears to have puzzled this out. In a paper in *Euphytica*, a group of scientists of the International Center for Agricultural Research in the Dry Areas (ICARDA), the International Maize and Wheat Improvement Center (CIMMYT), the International Winter Wheat Improvement Program (IWWIP) and national wheat research programs in Central and West Asia published the results of an extensive study that identified a number of wheat lines that are up to par. Not only do they do better against yellow rust, but also have yields higher than those of locally bred wheat. These wheat lines can yield up to 10 tons ha<sup>-1</sup>. Seed multiplication of a few such lines is currently under way on 126 ha in Uzbekistan and Tajikistan. There are plans to allocate 2,500 ha for seeds in 2014, and reach the 50,000-hectare mark in 2015. The



*New wheat lines can yield up to 10 tons per hectare. Photo by Sherzod Qosimov.*

new lines will help to remove the need for costly fungicides and increase profit margins. The study is proof of how important international cooperation is for agricultural research. In the final analysis, the research results are sure to contribute to food security and improved living standards in rural areas in the region.

## Grafting technology to help farmers in Uzbekistan get more tomatoes

Vegetable production in Central Asia and the Caucasus is forecast to be affected by climate change. Soil-borne diseases and other factors are believed to add to a reduction in vegetable yields and quality. This requires adapting plants to negative environmental effects. And grafting offers one of the solutions to this problem. Vegetable grafting is a promising technology used to improve plant tolerance to biotic and abiotic conditions.

In partnership with Tashkent State Agrarian University, a team of researchers led by the World Vegetable Center (AVRDC) Regional Office conducted an extensive research study on tomato grafting from 2010 to 2012. The study was carried out at Tashkent State Agrarian University under the ICARDA-Michigan State University Project, Development and Delivery of Ecologically-Based Integrated Pest Management Packages for Field and Vegetable Crop Systems in Central Asia. The aim of the study was to select promising tomato lines for greenhouse cultivation and using them as rootstocks, as well as to develop appropriate grafting technology and produce recommendations on tomato grafting to improve yield and fruit quality.

The study examined 16 tomato lines from the AVRDC and the four most promising varieties were selected. They were used as rootstocks for grafting the local variety Gulqand. Non-grafted Gulqand plants were used as a control sample. The results showed differences in fruit quality, yields and growth between the experimental and control plants. The grafted tomato plants produced up to 30% more fruits than the control sample did, and depending on rootstocks some of the grafted plants gave as much as two times more tomatoes. They also had larger fruits and better chemical composition.

The study confirms that grafting is good for plants in many ways and increases their resistance to soil-borne diseases, including *Fusarium oxysporum*. The promising lines were recommended for use as rootstocks and in further research, breeding and quality seedling production for farmers.

The technology was presented during three tomato grafting training courses, which were held in 2012 and attracted 52 people, including postgraduate students, researchers, specialists and farmers.

Judging from the training courses, there is considerable interest among farmers in the technology. This technology will surely help Uzbek smallholder farmers to produce more tomatoes in greenhouses and get more income as a result.



*Grafted tomato plants bear fruits.  
Photo by Bakhtiyor Karimov.*

## NEW PROJECTS

### New project to study utilization of low quality water for halophytic forage and renewable energy production

Salinization is a major problem facing the agricultural sector in arid and semi-arid regions of Central Asia. A possible avenue for reclamation of saline lands is the use of halophytic species (salt-loving plants) that remove salts from saline soils and water. In this context, ICBA in close collaboration with the University of Nebraska, USA started a new USAID-funded project (2012-2014), which builds on research already underway by targeting the cultivation and sustainable production of halophytes for forage and renewable

bioenergy uses on unproductive, marginal salinized lands surrounding hundreds of small lakes in the Aral Sea Basin in Uzbekistan. Previous research has indicated that these small lakes have potential utility as an aquatic resource for aquaculture or irrigation, but this utility is sensitive to inducing salinization that could render the water unusable. Hence, reclaiming saline lands near these lakes may benefit the economic utility of both land and water by reducing salt loads to the lakes.



*Industrial halophytic mixed plantations dominated by Salsola dendroides, Tamarix laxa and Karelinia caspia on clay loamy saline soil in Syrdarya region, Uzbekistan. Photo by Kristina Toderich.*

This project will involve laboratory and field experiments combined with participatory work of local farmers, herders and land managers to assess the potential of halophyte use in relation to utilization of low quality water including lakes: 1) the use of saline water to irrigate halophytes and salt-tolerant crops, and 2) the economic utility of

growing halophytes on marginal lands in relation to maintaining lake water quality and crop production. As one possible economic use, the project will assess the potential for integrating land reclamation using halophytes with bioenergy production and livestock feeding resources as degraded lands are made fertile. Research activities will involve collaboration with the Institute of Chemistry of Plant Substances, Academy of Sciences of Uzbekistan, National University of Uzbekistan, Urgench State University, the Hydrometeorological Research Institute of Uzbekistan, and the local NGO “Khorezm Rural Advisory Support Service” (KRASS).

Training of young Uzbek scientists and farmers in implementation of biosaline technologies (utilization of marginal lands and water resources) and analysis of economic feasibility of using halophytes for land reclamation, forage and bioenergy production, as well as the tradeoffs of such development with water quality and economic productivity of water bodies are also considered. The realization of the project addresses the USAID programmatic interest of water resources management and improving household incomes of the country farmers. In particular, the project will benefit small, remote rural communities with limited energy supply, increase overall energy-efficiency and ensure sustainable land/water use and stabilization of ecosystem function. Collaboration with researchers from different academic institutions, farmers, herders, and land managers will provide data for examining implications of results to other regions with similar environments.

## Community based reforestation project starting in Nurata, Uzbekistan

ICARDA together with Samarkand Division of Academy of Sciences of Uzbekistan and Uzbek Research Institute of Karakul Sheep Breeding and Desert Ecology started a new project for community based reforestation of foothills in Nurata, Navoi district, Uzbekistan. The project was launched in September 2012 and is locally supported by Navoi Branch of Uzbek Scientific Production Center for Agriculture.



*The project approach developed by Kadok villagers might become important for large areas in Uzbekistan. Photo by Stefanie Christmann.*

In Uzbekistan, the Main Department of Forestry under the Ministry of Agriculture and Water Resources is engaged in reforestation, but the country has also high potential for community based reforestation - specifically in foothill areas suffering from mudflows and scarcity of forage. Villagers of Kadok (Nurata) had identified reforestation of foothills as priority activity when they developed a

local climate change adaptation strategy within a former ICARDA project (Papanaya) in 2011. At present, mudflows frequently destroy vineyards, orchards and village infrastructure. The foothills are bare of trees, and even forage plants get scarce due to mismanagement of natural vegetation by severe overgrazing and fuelwood collection. Restoration of degraded slopes with native trees and forage shrubs would simultaneously decrease the risk of mudflows, sustain livestock and give way for creation of new income options with small water footprint. Villagers identified two aspects as crucial for restoration of foothills: Enforcement of prohibited free grazing on reforested slopes and election of a core group of villagers to manage reforestation and sustainable use of sites.

The “Kadok strategy” is an excellent blue-print for climate change adaptation of foothill areas in semi-arid zones of Central Asia. Therefore, Federal German Ministry for the Environment, Nature Protection and Nuclear Safety agreed on funding a pilot research to develop such governance structure within the International Climate Change Initiative.

Currently, households benefit from forage on foothills by letting their livestock (mainly goats) graze freely there, specifically in spring. But as plants are continuously browsed, the benefit is much below the potential of the site in terms of biomass accumulation as forage.

The most important lever to gain consensus of all households for prohibition of free grazing on these areas and for a new collective governance system is higher benefit by the new system and a guarantee that each household gets the same share. To establish such lever, in the beginning of October 2012 a group of elders from Kadok village decided to form a “Foothill User Group” (FUG) of all households for equal share of tasks and benefits. Each member (each household) agrees on stop of free grazing on restored slopes and introduction of collective harvest days and equal share of harvest for each household (starting with forage and firewood shrub, later medicinal plants). As harvest will be done manually, overuse and uprooting can be avoided. An elected core group shall enforce prohibition of free grazing, develop a sustainable system to care for livestock, organize reforestation and later collective harvest days and equal harvest share. Additional to the governance system for the village, an agreement with neighbors was developed. At the end of October, all aksakals [senior leaders] of that area signed an agreement that each village will respect reforestation efforts of other villages and keep their livestock out of those slopes.

Before the reforestation and seeding starts, slopes will be slightly terraced. Then forage shrubs like *Kochia prostrata*, *Ceratoides ewersmanniana* and *Halothamnus subaphylla* will be seeded, because their strong root systems can prevent soil erosion and reduce the risk of mudflows. Villagers already prepared some seedlings for trees, but their number will be increased by growing plants in a nursery. Villagers identified native medicinal trees like different local almonds (e.g. *Amygdalus bucharica*, *A. spinosissima*), hawthorn (*Crataegus turkestanica*) and shrubs such as wild rose (*Rosa canina*) as key species for restoration.

Besides providing forage for livestock and income from medicinal trees/shrubs the forest will enhance the natural beauty of the landscape and allow development of recreational day tourism as additional future income option. Income from tourism shall fund further reforestation; the core team shall govern the fund.

## ICARDA continues research on climate change adaptation

Climate change is a major threat to food production in dry areas of the world. Regional studies of the impacts of climate change in the semi-arid regions of Central Asia are sparse, and those available rely on crude assumptions on the biophysical characteristics of crops, soils and climate as well as the agronomic management practices. The results of the ICARDA/IFPRI project “Adaptation to Climate Change in Central Asia and People’s Republic of China”, which was funded by Asian Development Bank, showed that a rise in air temperature in spring, and corresponding heat stress during flowering leading to flower sterility, was the main factor affecting winter wheat productivity in Central Asia. In this context, ICARDA in close partnership with the Kashkadarya Research Institute of Grain Breeding and Seed Production of Cereal Crops started a new project “Testing of selected facultative wheat varieties for tolerance to heat stress during flowering”. The project will be implemented from September 2012 to August 2015, and is part of the larger, multi-disciplinary CGIAR Research Program on climate change, agriculture and food security.

It is being carried out at an experimental site of the Kashkadarya Research Institute in Kovchin village

of Karshi district, Kashkadarya Region, Uzbekistan. It involves field experiments to assess the potential of crop management practices (best sowing time) along with screening of improved heat tolerant winter (facultative) wheat germplasm to cope with heat stress during flowering and to assess associated yield losses.

The project also includes crop modeling and biophysical research conducted by an international project team from ICARDA (Dr R. Sommer/Dr D. Turner project technical coordination; Dr Mariya Glazirina, crop modeling and climate change specialist; and Mr Tulkun Yuldashev, irrigation specialist) and a national research team (Dr Zokhid Ziyadullaev, Director; Mr Diyor Juraev and Mr Sherali Ismatov, researchers of the Kashkadarya Research Institute). The research activities also involve collaboration between ICARDA and chemical laboratories of the Research Institute of Irrigation and Water Problems and the Uzbek Cotton Research Institute in Tashkent.



*Researchers set up automatic weather station and learn how to download meteorological data onto laptop. Photo by Yuriy Tarasov.*

As the results of the ICARDA/IFPRI project showed, crop modeling studies for climate change assessment require accurate and high precision meteorological, soil moisture and soil salinity data. This means that researchers need modern equipment. To meet this need, a Decagon automatic weather station and sensors for measuring soil salinity, temperature and moisture were provided to the Kashkadarya Research Institute under the project. All this equipment was installed in mid-October 2012 in Karshi and Kovchin village, and institute research staff received on-site training on downloading collected data for further analysis.

Preliminary soil sampling and analysis was carried out in mid-September 2012. Eight varieties of facultative wheat (Hazrati Bashir, Amirbek, Gozgon, Jaihun, Elomon, Humo, Sanzar 4, Saidaziz) were planted on 21 October 2012 and 14 November 2012.

## MEETINGS, SEMINARS AND CONFERENCES

### Linking collaborative agricultural research and development in Central Asia and the Caucasus discussed at FAO Regional Office in Budapest

Dr Dyno Keatinge, Director-General of the World Vegetable Centre and Chair of the consortium of international agricultural research centers operating in Central Asia and the Caucasus (CAC) under the aegis of the International Center for Agricultural Research in the Dry Areas (ICARDA), and Dr Jozef Turok, ICARDA Regional Coordinator for CAC, visited the FAO Regional Office in Budapest. They gave a presentation entitled “Supporting collaborative agricultural research in CAC”, which summarized the history of the consortium, outlined bio-physical constraints, key economic and policy drivers in the Region, and highlighted examples of ongoing collaborative research activities and future perspectives.

The regional research consortium assists the eight CAC countries in achieving sustainable increases in the productivity of crop and livestock systems through development, adoption and transfer of production technologies, natural resource management and conservation strategies, by strengthening agricultural research and fostering cooperation among the countries and the centers. Eleven centers currently participate in the consortium, among them eight centers of the Consultative Group for International Agricultural Research (CGIAR) and three non-CGIAR centers. It works in close collaboration with national partners, in particular research organizations, governments, policy makers, farmers’ associations, universities and other stakeholders.

The consortium has a long-standing partnership with FAO in the Region since the early 1990s. Conservation agriculture, plant genetic resources, sustainable water and land management as well as knowledge management and agricultural innovation systems have been main areas of cooperation.



*From left to right: Nevena Alexandrova (FAO), Jozef Turok (ICARDA), Fernanda Guerrieri (FAO Assistant Director-General and Regional Representative for Europe and Central Asia), Dyno Keatinge (Director-General, World Vegetable Centre) and Michal Demes (FAO). Photo by FAO.*

Central Asia and the Caucasus is a Region characterized by land degradation processes on a large scale, associated with soil salinity, low soil fertility and soil erosion. These processes are further exacerbated by demonstrated above-average influences of climate change. Moreover, use of water per unit area of agricultural production is very high, owing to old and inefficient irrigation infrastructures, among other factors. Under these harsh conditions, the application of water-use efficient techniques and proper soil and crop management practices is essential. It is also necessary to use highly productive crop varieties that can be grown under local production systems, are tolerant to biotic and abiotic stress, such as soil salinity, and meet market requirements of the local population. An enabling policy and institutional environment is key factor for their implementation.

In fact, bringing the results of research to practical implementation is a key concern shared by both organizations. FAO as the inter-governmental forum for facilitating policy dialogue can sensitize the policy makers on the potential of knowledge-based bio-economy. Therefore, linking collaborative research with development goals in the CAC region offers opportunities for synergy.

The seminar was well attended by the FAO officers responsible for the different thematic areas. Partners from the University of West Hungary with research interests in CAC also participated in the meeting. Progress made in the shared thematic areas of work was briefly reviewed during the discussion. Capacity building, for instance through organizing joint training courses, was recognized as an area where both organizations intend to further strengthen collaboration. Collaboration in information sharing with the CAC Association of Agricultural Research Institutions (CACAARI) was also highlighted.

The discussion with Ms. Fernanda Guerrieri, the Regional Representative for Europe and Central Asia focused on further strengthening collaboration in the CAC Region, which includes several priority countries for FAO. Food and nutritional security, animal health and sustainable advisory services were highlighted as main priorities for FAO's work in the Region. Collaboration with resource partners for the CAC Region was also explored during the discussion.

The research questions are highly inter-related and the development of solutions requires an approach that integrates crops, livestock, natural resource management research and the necessary policies to support improvements. In fact, taking a more integrated approach in public research is at the core of the reform in the Consultative Group for International Agricultural Research. As an example of what the

future approaches will look like, the visitors explained the new CGIAR Dryland Systems Research Program referred to as CRP1.1 “Integrated Agricultural Production Systems for Improving Food Security and Livelihoods in Dry Areas” – a global partnership of several dozen actors, including national research systems and universities, extension services, civil society organizations, advanced research centers, as well as FAO and other international development partners. The Program will engage in large-scale action research to identify ‘best-bet’ intervention packages. It will validate their effectiveness in specific agro-ecosystems, and promote scaling-up in dry areas of five regions globally, including CAC. The integrated production packages will combine improved crop varieties, suggestions for diversification to new types of crops, approaches for effective land and water management, disease and pest management, socioeconomic considerations and policy and institutional options.

This ‘systems approach’ provides new opportunities for the international agricultural research centers and FAO to work even closer together along the research-for-development continuum. Their existing partnership in CAC will continue promoting the effective uptake of collaborative research knowledge and innovation into better policies and development of practices for the benefit of the smallholder farmers.

## Steering Committee Meeting reviews progress and sets strategic priorities for agricultural research

The Fifteenth Steering Committee Meeting of the Regional Program for Sustainable Agricultural Development in Central Asia and the Caucasus took place on 4-6 September 2012 at Issyk-Kul in Kyrgyz Republic. Senior officials responsible for national agricultural research from Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan as well as Directors General or their representatives from the international agricultural research centers attended in their capacity as members of the Steering Committee. Observers from two partner organizations (Eurasian Center for Food Security - ECFS, Russian Federation, and German International Cooperation Agency - GIZ) and participants from various institutions in Kyrgyz Republic also attended the meeting.

The meeting aimed at providing overall strategic, technical and policy guidance for the Program, reviewed the progress during the past year and made a number of recommendations and decisions concerning the Program in general and the Program Facilitation Unit (PFU) in particular. It was held in the same venue where the Ministerial-level meeting on strengthening agricultural research in Central Asia and the Caucasus adopted the “Issyk-Kul Declaration” eleven years ago (in 2001), which became the road map for collaborative activities for years to come.

Acad. Dzhamin Akimaliev, Head of the National Agricultural Research System in Kyrgyz Republic opened



*Participants of the Steering Committee Meeting. Photo by Sherzod Qosimov.*

the meeting. He highlighted that international collaboration on wheat improvement had resulted in the release of five varieties of winter wheat, namely 'Almira', 'Djamien', 'Azibrosh', 'Zagadka' and 'Zubkov'. These five varieties are grown on approximately 150,000 ha of the total 373,000 ha currently under wheat cultivation in Kyrgyz Republic. He also mentioned important achievements of "Soil and Water Management Project", livestock, potato and vegetable improvement activities. Dr Dyno Keatinge (AVRDC), co-Chair of the Steering Committee, shared with the participants figures confirming a steady increase of mean annual temperatures associated with a dramatic decrease of rainfall in some parts of the Region. He emphasized that food and nutritional security continued to be main goal of the Program. Increasing the resilience of dryland agro-ecosystems and sustainable water management practices were key approaches to be followed.

Following the annual report made by the Head of the Program Facilitation Unit, a number of short presentations were made by the scientists of the Centers jointly with the national research partners. They highlighted progress in the different areas of work such as development and out-scaling of new varieties, multiplication, conservation of genetic resources, biosaline agriculture, integrated pest management, improving water productivity and climate change adaptation research. All presentations made during the meeting are available on the Program's website [www.icarda.cgiar.org/cac/15scm.asp](http://www.icarda.cgiar.org/cac/15scm.asp).

Bio-fortification was mentioned as a research topic shared by several Centers, with experience being obtained on different crops in different parts of the world. There was some discussion on long-term climate change projections, and the conceptual shortcomings inherent to different modelling approaches, for instance how technological change is incorporated. The importance of analyzing past effects of climate change on agriculture should not be under-estimated. In this regard, Dr Kamel Shideed (ICARDA) mentioned a pipeline project that will allow research on climate change adaptation to continue within the framework of Central Asian Countries Initiative for Land Management (CACILM), with expected financial support by International Fund for Agricultural Development (IFAD).

The need for continued capacity building of young generations was emphasized by the representatives of National Agricultural Research Systems. They also presented their expectations and views on collaborative research for increasing productivity of agricultural systems, natural resources management, conservation of genetic resources, socio-economic and public policy research, the four key areas of the Program. As the key problems faced by agricultural research, the following issues were identified: inadequate attention and lack of political commitment, poor linkages between research and development agendas, and lack of involvement of all relevant stakeholders (at national level), including the difficulties encountered in integrating actions and absence of a larger international policy commitment (at Regional level).

It was noted that currently the CAC countries invest a very small proportion of their agricultural gross domestic product in research. This is estimated to be less than 0.1% on average, according to the Regional strategy (2011) of the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI). The figure is widely considered extremely low, with the target level of 1% agreed by all National Agricultural Research Systems to be reached by 2025. After the collapse of the former Soviet Union, state budgets available for agricultural research decreased significantly. However, the rapidly growing transition economies allowed for increasing investment. For instance, Kazakhstan reformed and increased investment in its agricultural research as much as tenfold since independence. The discussion focused on possible approaches and steps for facilitating higher investment into agricultural research in the CAC Region. The available funding from state budgets is often supplemented by small projects supported by local or regional authorities. Participation in international projects remains a critical opportunity for conducting research in the Region. The availability of public-private partnerships for supporting innovations in some (horticulture) but not all areas of agricultural research for development was noted. The lack of research coordination at national level was repeatedly mentioned as a constraint in several countries.

Dr Kamiljon Akramov (IFPRI) mentioned Agricultural Science and Technology Indicators (ASTI) to be a useful tool for convincing policy makers. It essentially profiles agricultural research for development in countries worldwide. Unfortunately, collecting and analyzing ASTI data has been difficult in the CAC countries owing to lack of responsiveness by national focal points. It was generally agreed that needs assessment, gap analysis and research prioritization were necessary elements of a Regional approach. The meeting acknowledged the central role played in this approach by CACAARI. Dr Alisher Tashmatov

(CACAARI Executive Secretary) mentioned the critical importance of capacity building at all levels. Some participants mentioned positive examples of supporting and engaging young talent in agricultural research through state grants schemes, e.g., in Uzbekistan. A proposal was made to engage Universities more closely and pro-actively in agricultural research for development. Research connected with higher education in agriculture has a long tradition in Central Asia and the Caucasus.

Recognizing the need for more effective communication with high-level policy makers with a view to increasing the commitment and mobilizing investment of the CAC countries for agricultural research, it was recommended to encourage organizing a Ministerial-level conference in 2014. In addition, the modalities and possible partnerships for organizing such event were discussed.

During the discussion of the status of CGIAR Research Programs (CRP) in the Region, the members noted the regional inception phase for the CRP “Dryland Systems” as a positive experience in building the strategic and multi-disciplinary nature of the Program. The CRP combines multi-disciplinary approaches with site-specific implementation, and establishes an important baseline. Its implementation in the CAC Region will require enhanced communication and coordination among the Centes involved. The Steering Committee, therefore, recommended that efforts to coordinate activities and accomplish synergies among the Centers should be continued. Recognizing the value of opportunities for collaborative research provided by the CRPs, the Steering Committee agreed that the research portfolio of the Program should not be limited by the CRPs, and re-affirmed the role played by the Steering Committee in setting strategic priorities. Defining the need for the Program to focus its agenda on a few key development challenges in the CAC Region, in which it has the highest added-value potential, the Steering Committee recommended that a workshop could be organized as a joint event by several Centers and countries during next year. Salinity and water logging, and sustainable wheat production were mentioned as two examples of relevant and significant areas to review current state of knowledge, disseminate outcomes of previous research and agree on future common approaches.

During the discussion of the Program Facilitation Unit’s mode of operation, services and sustainability, Steering Committee members focused on publications. Whereas results of the collaborative applied research are best published in local journals or disseminated through dedicated technical publications, every opportunity should be taken to publish in international refereed journals. The Steering Committee encouraged the staff and partners to publish their joint results in international journals. It was also agreed that the Program would organize a training course on science writing skills, possibly in conjunction with the next Steering Committee meeting.

The Committee then approved the budget of the PFU for 2013 (at same level as in 2012). Acknowledging that the transition process of the CGIAR has not been fully completed, and recognizing that the PFU provides services typically included in overheads, the Steering Committee recommended a funding scheme that combines fixed membership contributions of the Centers with a small levy on projects implemented through the Program. Such scheme was considered more equitable than fixed membership contributions only.

Several presentations summarized the resource mobilization initiatives taken during the past year. Dr Dyno Keatinge (AVRDC) reported on the outcomes of a trip that he as co-Chair and accompanied by the PFU Head carried out to visit the European Commission in Brussels and donor agencies in several European countries. Prof. Sergey Kiselev (ECFS) explained the history of the “Russian Initiative” for international agricultural development. The efforts and initiatives to mobilize additional resources for the activities from sources within and outside the Region were acknowledged and their continuation encouraged by the Steering Committee. The role of the PFU in gathering intelligence and managing donor knowledge was stressed. It was suggested that the PFU could serve as both gateway and facilitator of information on funding opportunities in the Region and for the Region.

Recognizing the common research interests in the CAC Region and acknowledging the high potential for mutually beneficial collaboration, the Steering Committee recommended that the Eurasian Center for Food Security (ECFS, Russian Federation) and the International Center for Integrated Mountain Development (ICIMOD) be invited to become members of the Program Steering Committee.

Dr Hukmatullo Ahmadov, President of Tajik Academy of Agricultural Sciences was elected as co-Chair of the Program Steering Committee. The next Steering Committee meeting is planned in Tajikistan, in 2013.

## Central Asia and the Caucasus represented at Global Conference 2012

The Second Global Conference on Agricultural Research for Development (GCARD) was held in Punta del Este, Uruguay, 29 October to 1 November 2012. The event focused on ways to implement the objectives identified in the GCARD Roadmap, which was endorsed at the first GCARD two years ago. Specifically, attention was given to foresight and partnerships for innovation and impact on smallholder livelihoods. The conference was set to become an effective platform to build cooperation around key forward-looking agendas and to plan joint actions among all stakeholders to facilitate wider international partnerships and development oriented research programmes that could lead through to substantive impacts.

The conference was opened by Prof. Monty Jones, Chair of the Global Forum on Agricultural Research (GFAR), Dr. Carlos Perez del Castillo, CGIAR Consortium Board Chair and H.E. Tabaré Aguerre, Minister of Livestock, Agriculture and Fisheries of Uruguay. It was mainly held in the format of thematic parallel sessions addressing foresight, partnerships and capacity building for impact on smallholder farmers. A “market place” with lots of information and knowledge sharing opportunities was also open to the participants, and six different field trips were organized on the last day. GFAR and its regional organizations held a number of pre-conference meetings of the key partners.



*Farmers involved in on-farm seed multiplication trial of sorghum. Sorghum is a salt-tolerant crop with high potential for food and feed in the Aral Sea Region.*

*Photo by Kristina Toderich.*

About 700 participants representing different partner groups of agricultural research for development attended. A small delegation from Central Asia and the Caucasus (CAC) was led by Acad. Dzhamin Akimaliev, chair of the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI), one of the six regional fora of GFAR. The delegation comprised representatives of national farmers' associations from Georgia, Tajikistan and Turkmenistan, education and extension services (Georgia, Kyrgyz Republic, Uzbekistan), private sector (Armenia), non-governmental organizations (Uzbekistan)

and research organizations (Azerbaijan, Kazakhstan, Kyrgyz Republic and Tajikistan). The regional consortium of agricultural universities for development (called “CASCADE”) also attended. Universities traditionally play a crucial role in agricultural research in this part of the world.

The participants from the CAC Region made two presentations in the technical sessions. Dr. Oleg Shatberashvili (Georgia, CACAARI) highlighted regional views on research and innovation priorities for future needs and impacts, combined with foresight. He made specific reference to the recently adopted Regional Synthesis report of CACAARI. Key identified problems faced by agricultural research at national level include inadequate attention and lack of political commitment, poor linkages between research and development agendas, and lack of involvement of all relevant stakeholders. At CAC Regional level, absence of a larger international policy commitment represents one of the key challenges.

In his presentation made in the session “Partnerships for Environmental Resilience: Land, Water, Forests and Landscapes”, Dr. Jozef Turok (CGIAR Program Facilitation Unit for CAC and ICARDA Regional Coordinator) focused on international actions for the Aral Sea. The drying up of the Aral Sea was called by the United Nations one of the worst manmade environmental disasters in the world. He shaped his message to the audience in three steps: challenges immediately around the Aral Sea and in the wider Basin; on-going initiatives and partnerships; and perspectives with specific emphasis on large scale investment needs in agriculture and water management. The presentation highlighted the role of national, regional and international institutions in place, the partnership mechanisms they have built and the success stories, which some of them could be counted as the results of implementation of the tasks set up by the GCARD Roadmap.

Several new collaborative initiatives aimed at strengthening environmental resilience in different parts

of the world were presented during the session. The lively discussion focused on the role and perspectives of natural resource management in the CGIAR. Two global Research Programs, namely Water, Land and Ecosystems; and Forests, Trees and Agroforestry, were introduced.

In his interview with one of the social reporters, Dr. Alisher Tashmatov, CACAARI Executive Secretary, mentioned recent Tashkent Declaration on Climate Change Adaptation and Food Security Strategies in the CAC Region. He also emphasized the importance of knowledge sharing facilitated by this global conference.

No conference without clear commitments by “stakeholders” (partner groups) will have substantial impact on the ground. So what are the outcomes of GCARD 2012? At the time of writing this article, the comprehensive list of outcomes and commitments made by all of the constituencies were not yet publicly available. Dr. Frank Rijsberman, chief executive officer of the CGIAR Consortium of research centers gave an overview of fifteen key commitments made by his organization in the event in Punta del Este. These commitments are related to foresight, knowledge, capacity building and partnerships (<http://www.cgiar.org/consortium-news/our-punta-del-este-commitments/>).

“Taken together, these commitments will shape and drive the next-year collaborative research agenda of the CGIAR Consortium in partnership with the CGIAR Fund Council and advisory bodies, numerous partners and stakeholders outside the system”, he said. Provided that there are eight CGIAR centers (and three non-CGIAR international centers) operating in CAC, these commitments will surely re-define the way of thinking and the progress of work undertaken and supported through the Regional Program for Sustainable Agricultural Development in the CAC Region.

As a last note but not least, this year’s GCARD has seen a dramatic increase in the youth voice in agricultural research for development. Bringing almost thirty young professionals from around the world (12 of them as fully funded trainees) to act as young social reporters is the reflection of this point. Initiated by Dr. Enrica Porcari, chief information officer at CGIAR and coordinated by Young Professionals’ Platform for Agricultural Research for Development (YPARD), the project was hugely successful in bringing the youth voice into the conference and taking and spreading the outcomes of the conference to the world. Above all, the social reporters were given freedom in expressing their thoughts and insights through the tools they had at hand. CAC was represented by Firdavs Kabilov of International Water Management Institute’s Tashkent office and Meerim Shakirova of Central Asian Regional Environmental Centre – Bishkek office. In fact, they contributed this article for the E-Newsletter.

“GCARD is a unique space, where the world’s agricultural research for development stakeholders meet to plan together, take stock of progress and make joint commitments. GCARD is a process but not merely an event” said Prof. Monty Jones while opening the event. Let us hope that these will truly be the case! Further reading at [www.egfar.org/gcard-2012](http://www.egfar.org/gcard-2012).

## Climate change conference spurs cooperation in Central Asia, Caucasus

It is expected that climate change ramifications will hit hardest parts of the world where precipitation is low or is expected to fall. Central Asia and the Caucasus (CAC) can be a case in point. In the region where agriculture still remains the primary source of livelihood for most of the population and large numbers live in rural areas, sustaining sufficient food supplies may pose serious problems.

The CAC countries have long had the challenge of ensuring sustainable livelihoods for their populations in the fragile ecosystems of semi-arid and arid areas facing water shortage, drought, land degradation and desertification. In addition to these, the region also has to deal with other challenges, including a significant population increase, geopolitically fragile environment, poor investment in agricultural research and constraints in human resources and institutional capacities.

All this calls for more cooperation between government agencies, researchers and farmers. Scientists can help farmers make informed choices on best field practices and sustainable agricultural development strategies. Most importantly, CAC researchers and their counterparts in other regions need to cooperate more and share knowledge and information. This will help to design climate change adaptation strategies that would work not only for individual countries but for the whole of the region too.

A comprehensive and integrated approach to planning and implementing climate change adaptation strategies across a wide range of agro-ecosystems could help both planners and local communities to deal effectively with projected impacts and also contribute to the mitigation of climate change effect.

To this end, researchers, government officials and policy makers in CAC meet periodically to discuss these issues. This time a number of leading experts and researchers gathered for an international workshop in October 2012. Some 60 participants from 14 countries and representing nine international and regional organizations came to the International Workshop on Climate Change Adaptation Strategies for Agriculture and Food Security in Central Asia and the Caucasus, held in Tashkent from 22 to 24 October 2012. The organizing committee included the World Meteorological Organization (WMO), the Association of Agricultural Research Institutions in Central Asia and the Caucasus (CACAARI), the Food and Agriculture Organization (FAO) of the United Nations, the International Center for Agricultural Research in the Dry Areas (ICARDA) and the Global Forum for Agricultural Research (GFAR).

On the agenda were climate change impact on agriculture and food security in the CAC region, developing suitable adaptation strategies for each country and laying the foundations for increased collaboration. Everyone agreed that it is necessary to integrate research and practice and build up cooperation between academic, research institutions, international organizations and NGOs at local, national and regional levels. Mr Norbert Josten, head of the European Union (EU) Delegation in Uzbekistan, stressed the importance of sharing information in developing policies not only between the Central Asian countries and the EU but also with EU institutions and agencies. But this means that some principles or guidelines for such cooperation need be in place first. Dr Robert Stefanski, of the World Meteorological Organization (WMO), said that setting up a regional framework for information exchange on climate change impact and adaptation was a key objective of the meeting.

Lack of consistent cooperation is, however, not the only issue. There is not enough interest among young graduates in doing agricultural or climate change research. As Dr Gert-Jan Stads, of the International Food Policy Research Institute, pointed out, increasing human and institutional capacities is an urgent task. Training a new generation of agricultural scientists in the region is essential, since there is a shortage of well qualified specialists, as evidenced in Kyrgyzstan, he added.

Dr Jelleke de Nooy van Tol, of Network Vital Agriculture and Food, Agro-ecosystems and Food Production, echoed this view. She also noted the need to increase the number of researchers and young professionals who work closely with farmers. Farmers often lack knowledge, skills and technology to deal with problems stemming from drought and water shortage. If they know about threats climate change poses and the latest research results, they could take action. Take weather forecasts. Many farmers rely on them. Knowing the weather in advance can be a huge advantage. Not only would farmers know what and when to sow, but also how much return to expect. To improve cooperation between research institutions and farmers, as well as among different research institutions in the region, the meeting decided to set up a regional network of agro-meteorologist and agricultural researchers, and all interested parties. In fact, the network is promoted by CACAARI and is the first step towards an integrated information-sharing system.

The conference ended with the signing of the Tashkent Declaration, a document setting out recommendations for policy makers and international organizations. The declaration calls for enhancing capacity-building activities in the CAC region; supporting multi-disciplinary action research (involving farmers) on climate change and food security; and developing innovative strategies that contribute to socioeconomic sustainability of the production systems in fragile environments. A specific focus in the document is on improving regional cooperation and experience-sharing among countries through setting up a Network for Climate Change and Food Security in Central Asia and the Caucasus and an online newsletter, Farming Matters. The document also notes that it is important to communicate climate change implications to the wider society and involve communities more actively. Above all, the declaration highlights the role of government and development agencies and urges them to support programs aimed at adapting agriculture and rural communities to climate change while sustaining food security and food production systems in Central Asia and the Caucasus.

The Tashkent Declaration and other conference information can be found on CACAARI's website at: <http://www.cacaari.org/activities/sections/events>.

## Regional conference mulls vegetable research for better livelihoods in Central Asia and the Caucasus

Vegetable production is one of the important branches of agriculture in Central Asia and the Caucasus. Sowing areas have increased constantly during the past years and stood at 783,200 ha in 2010. The average yield of vegetable crops increased from 19 t/ha to 20.4 t/ha between 2006 and 2010. Total vegetable production has increased by 33.2 per cent and was 17.5 million tons in 2010. Currently, in terms of annual vegetable production, Uzbekistan (7.5m tons) and Kazakhstan (3.7m tons) are the biggest vegetable producers in the CAC Region (FAOSTAT, 2012).

There are constraints in vegetable production in the countries of the Region, which are moving towards market-oriented economies. Although there are favorable climatic and soil conditions, and technologies are available for vegetable cultivation in protected agriculture (greenhouses, tunnels), vegetable production is still seasonal. Around half of the production is in the autumn (August – September), and a quarter is in the summer (June – July). Very few vegetables are cultivated in the winter (November – January) or the early spring (February – March).

The Central Asia and the Caucasus Regional Network for Vegetable Systems Research and Development (CACVEG), established by AVRDC-The World Vegetable Center in 2006, aims at assisting in the development of market-oriented vegetable production systems and promoting vegetable research strategies for the National Agricultural Research Systems (NARS) in the Region.

The Fifth Steering Committee Meeting (SCM) of the CACVEG Network was held in Tashkent, Uzbekistan, on 11-13 December 2012. More than 35 participants, including the national coordinators on vegetable systems R&D and specialists from eight CAC countries, participated in this meeting.



*Conference participants share experience on tomato grafting technology. Photo by Yulia Kopilova/Fayzulla Abdullaev.*

Country reports were presented by the national coordinators during the meeting. The discussion highlighted the fact that the network strengthens regional capacities in vegetable production through collaborative research, including AVRDC's new germplasm evaluation methods, expansion of non-traditional and indigenous vegetables, adoption of promising varieties and appropriate technologies; good agricultural practices and capacity building through academic studies, training and farmers' days.

AVRDC Regional Varietal Trials have been carried out annually in different soil and climatic conditions in Armenia (Research Center of Vegetable, Melon and Industrial Crops), Azerbaijan (Azerbaijan Research Institute of Vegetable Growing), Georgia (Research Institute of Crop Husbandry of the Agrarian University), Kazakhstan (Kazakh Research Institute of Potato and Vegetable Growing), Kyrgyzstan (Research Institute of Crop Husbandry), Tajikistan (Research Institute of Horticulture and Vegetable Growing), Turkmenistan (Research Institute of Crop Husbandry) and Uzbekistan (Uzbek Research Institute of Plant Industry, Uzbek Research Institute of Vegetable, Melon Crops and Potato and the Tashkent State Agrarian University).

Through collaboration with AVRDC, currently, 23 varieties of eight vegetable species are undergoing state variety trials in the eight countries. To date, a total of 28 new varieties of 7 vegetable crops, including tomato (6), hot pepper (6), sweet pepper (5), vegetable soybean (5), mungbean (4), yard-long bean (1) and cabbage (1) were developed as a result of collaborative research in the partner research institutes and registered with the State Variety Testing Commissions of Armenia, Azerbaijan, Georgia, Kazakhstan and Uzbekistan. Seeds of promising and new varieties are multiplied and shared with farmers. To facilitate adoption, farmers' days have been held in all countries, attended by more than 300 farmers, policymakers, business people and specialists. All released new varieties are characterized by very high marketability in the CAC Region. The meeting also discussed the arrangements for seed multiplication of promising

and released vegetable varieties to supply farmers with quality seeds for wide cultivation, increasing production and farmers' income, diversifying diet, and improving the export potential of vegetables.

Capacity building is an important task and an increasing number of young specialists have been involved in vegetable research. In 2011, two PhD theses were completed in Armenia (Davit Ghazaryan and Karine Sarkisyan). In 2012, one MA thesis (Bakhtiyor Karimov), as well as one PhD thesis (Shukhrat Asadov, Doctor of Agricultural Sciences) were completed in Uzbekistan, where AVRDC germplasm was used for research. Four more theses have been finished during the recent years. In total, 10 young specialists involved in vegetable research in the CAC countries took AVRDC-sponsored English language courses in their home countries. In fact, the seminar entitled "Prospective Research Directions in Vegetable Production in the CAC Region" was conducted as part of the fifth SCM, where fifteen young scientists from the Region presented the results of their research in the area of vegetable germplasm evaluation, breeding, improved cultivation technologies and seed production.

The attendees also touched on current activities and collaboration within the framework of CACVEG, existing problems and ways of strengthening further the capacity of NARS and vegetable R&D, as well as developing appropriate policy options that are critical for crop diversification, micronutrient security, cold season production, distribution channels, post-harvest technologies and market economy. The participants agreed on ways to approach the aforementioned issues and discussed and decided on continued collaboration within CACVEG.

Five national coordinators and research institutes' directors were awarded Certificates of Recognition for their efforts to disseminate improved genetic resources and technologies in Central Asia and the Caucasus. Among those awarded were: Drs. Gayane Martirosyan and Gayane Sarkisyan from Armenia; Dr. Temirjan Aitbayev, Kazakhstan; Acad. Dzhamin Akimaliev, Kyrgyzstan; and Prof. Botir Azimov, Uzbekistan.

A special session was dedicated to innovative technologies, such as tomato grafting technology, where participants had the opportunity to learn more about grafting technology prospects and conducted some practical work on plant grafting.

A training session titled "Promotion of Vegetables for Dietary Diversity and Health of the Population" was organized for the participants right after the SCM. These events gave the specialists the opportunity to share experience and information for further development of vegetable research and development in the CAC Region.

## CAPACITY BUILDING

### Irrigation extension services discussed in Fergana Valley

Water is the most crucial resource in Central Asia. Inefficient management in the water sector has resulted in unreliable and inequitable water distribution among and within the Water Users Associations (WUAs). Irrigation methods applied at field level result in high return flows and/or high water-tables. These irrigation practices are often considered to be a major reason of the low crop yields in the Region.

Since 2008, with the financial support of Swiss Agency for Development and Cooperation (SDC), International Water Management Institute (IWMI) and Scientific Information Center of the Interstate Coordination Water Commission of Central Asia (SIC-ICWC) in collaboration with sixteen partners from research institutes, information and training centers and various dissemination agencies (extension services) of the three countries sharing the Fergana Valley (Kyrgyzstan, Tajikistan and Uzbekistan) are implementing the project on Water Productivity Improvement at Plot Level (WPI-PL).

The WPI-PL project contributes to the enhancement of water productivity, crop yields and yield stability at plot level through improved on-farm/ on-plot water management, thereby avoiding negative environmental impacts such as waterlogging and salinization. The project objective has been to strengthen the capacity of the different actors, in terms of knowledge, dissemination of materials and methods, in the agricultural innovation system. It has established strategic alliances for transferring solid, well-adapted messages relating

to water productivity improvement at plot level. By the end of the project, it is expected to develop provincial level irrigation extension services for dissemination of knowledge and practices through innovative public-private partnerships starting from farmers to national research organizations. Currently, WPI-PL project is in its third phase (March 2012 to December 2012) with the specific objective of this phase being to systemize the research, training and dissemination materials that have been produced over the last years.



*Demonstration of one of the irrigation practices.*

*Photo by Kahramon Jumaboev*

On 13 August 2012, a Workshop was conducted to discuss mid-year progress of the project and the main challenges in sustainable operation of existing irrigation extension services in Fergana Valley. The meeting brought together more than thirty participants from the three countries. Many relevant actors, including Provincial Basin Management Organizations, Provincial Water User Association Support Units, and Information Centers and Agricultural Extension Services, participated with keen interest in the discussions.

Participants of the meeting highlighted that even though the institutional base is different in each country, there is a high potential to organize and develop rational irrigation extension services in the Fergana Valley within existing conditions. There are some private and public extension agencies in Kyrgyzstan and Tajikistan, while in Uzbekistan the major role in irrigation extension services is played by the Basin Water Management Organizations.

At the end of the meeting, participants developed and agreed on the following measures to strengthen the work of irrigation extension services:

- Further dissemination of water flume meters;
- Focus on qualification of the staff in WUA organizations;
- Frequent exchange visits between different organizations working within the irrigation extension system in the Valley;
- Strengthening of the economic monitoring and impact assessment of extension services;
- Development of national and regional databases on irrigation (materials and techniques);
- Building the mechanisms for dissemination of knowledge and methods among farmers.

In summary, the project strengthened the capacity of the different actors in agricultural innovation system through building strategic partnerships for dissemination of well-adapted extension messages relating to water productivity improvement at plot level. The project developed strategic alliances with national partners in the three countries that are interested in generating, translating and disseminating agro-technical and hydro-technical knowledge and experience. In total, the WPI-PL project involved 713 farmers (816 ha) in Kyrgyzstan, 96 farmers (4 547 ha) in Tajikistan and 155 farmers (7 784 ha) in Uzbekistan.

## Interest in conservation agriculture grows in Central Asia, Caucasus

Conservation agriculture (CA) is a concept for resource-saving agricultural production that aims at sustained and effective crop production and environmental conservation. It offers one of the most promising land use options that have been developed until today. It helps to deal with a broad variety of issues related to soil and water resources management, by focusing on the principles of no or minimum tillage, crop residue retention in the soil and crop rotation. National and international scientists have worked together in Central Asia and the Caucasus to promote knowledge about and use of CA practices among farmers, researchers and policy makers.

A FAO-supported project involving researchers, policy makers and farmers in the Region has been working towards this end. A series of training courses on various techniques used in conservation agriculture were arranged in autumn 2012 in Azerbaijan, Kazakhstan and Uzbekistan by the ICARDA-

CAC office and national partners to promote sustainable crop production, and laser land levelling and water use efficiency through CA.

The first one kicked off in Terter, Azerbaijan, on 3 October 2012. Some 45 officials, agronomists, irrigators, scientists and farmers attended the field training course on laser land leveling, organized in partnership with the Agrarian Center under the Azerbaijan Ministry of Agriculture. The participants included Drs Asad Musaeu, Seymur Safarli, Kamil Fataliev, Imran Jumshudov, of the Agrarian Center, and Dr Aziz Nurbekov, of ICARDA-CAC. Dr Nurbekov led the theoretical part explaining how a laser land leveler works, while Drs Jumshudov and Safarli gave demonstrations at an experimental station of the Azerbaijan Research Institute of Crop Husbandry in



*A field visit by training course participants in Azerbaijan. Photo by Aziz Nurbekov.*

Terter district and a farm in Barda district. Dr Jumshudov noted that laser leveling technology had already been introduced under different international projects, but was not successful at the time due to some factors, including slow adoption. He believes this project will come to fruition.

That the technology helps to save water is especially important. And Dr Safarli, a national consultant on irrigation, explained how it can reduce water usage by 25-30%. Dr Musaeu, Director General of the Azerbaijan Agrarian Center, said that he will recommend including laser land leveling technology in the national programme to improve farming and increase food security. As a first step, this method was used for soil preparation in an area of 5 ha allocated for winter wheat.

Conservation agriculture kindled great interest in south Kazakhstan too. During a training course held on 10 and 11 October 2012 in Chimkent, authorities, researchers and farmers in South Kazakhstan Region were briefed about conservation agriculture practices. The course attracted 47 specialists and researchers from the Agricultural Department of South Kazakhstan Region, research institutions, universities, colleges and farms. Dr D. Sydyk, Deputy Director of the Kazakh Research Institute of Livestock and Crop Production, and other senior staff of the institute were also in attendance. The course aimed to build awareness of CA among policy makers, researchers and farmers, and was made up of theoretical and practical sessions. The participants heard lectures and presentations on crop management and water-saving techniques by national project consultants, Drs Sydyk and Karabalaeva, and Dr Nurbekov. During field trips, machinery needed, including a no-till planter and a boom sprayer, were shown. This knowledge is sure to help them use conservation agriculture practices in the irrigated areas of South Kazakhstan Region. Everyone became convinced of the need to adopt the approach for the irrigated areas in the Region. The Agricultural Department of South Kazakhstan Region and local authorities were particularly upbeat about CA.

The last in the series was a training course for researchers and farmers in Uzbekistan. It took place in Karshi on 24 and 25 October 2012. Its aim was to introduce CA practices to farmers and show that no-till farming was also a viable agricultural method. Dr Zokhidjon Ziyadullaev, director of the Kashkadarya Research Institute of Breeding and Seed Production of Cereal Crops, started the event with a two-year progress report, followed by a presentation by Dr Nurbekov on conservation agriculture in Central Asia. Further presentations discussed various aspects of conservation agriculture. The discussions that followed revealed that most of the farmers were simply unaware of the conservation agriculture technologies used in other parts of the world. Later, a visit was arranged to demonstration fields to show CA in practice. While some farmers were keen on no-till, others with some previous basic knowledge were still cautious about it. They justified their caution by lack of knowledge and machinery used in CA. But as a solution, they were advised to start with small areas on their farms and learn from experienced farmers or researchers.

The training showed that slow adoption of new agricultural approaches in Central Asia and the Caucasus was partly owing to lack of expertise and awareness. This was proof of the need and importance of such training in spreading modern agricultural know-how among farmers and researchers in the Region. As

was evident from the feedback and suggestions by the farmers and scientists, and most importantly local authorities, there is support for and considerable interest in new methods of sustainable agricultural crop production. Thus, the project is paving the way for the adoption of CA as an alternative to the currently used methods of crop production in Central Asia and the Caucasus.

## Central Asian researchers trained in using crop modeling application

Spreading scientific know-how in Central Asia and the Caucasus is one of the priorities of the Regional Program. To increase cooperation among researchers in the Region, as well as their understanding of how data they supply is used and analyzed, ICARDA organizes training courses and workshops, including ones on using modern crop modeling applications like CropSyst. The software is an open-source simulation model that helps to study the effect of cropping systems management on productivity and the environment.

Although it is available for free (<http://www.bsyse.wsu.edu/cropsyst/>), it is not used widely by researchers in Central Asia. ICARDA scientists introduced CropSyst to a group of Central Asian researchers a few years ago as part of a project on climate change effects on rural populations. The crop modeling software is especially useful in the light of negative environmental factors that persist in parts of Central Asia. These include problems of soil salinity, lack of water resources or poor water management in certain areas, and increased demand for better agricultural land management. All this adds to the need for applying best practice in farming and advanced crop forecasting in different ecological conditions in Central Asia. And modeling applications like CropSyst come in particularly useful as its simulation model takes into account all environmental factors.

Its functionalities made it an analytical tool of choice during the three-year ADB-funded interdisciplinary research project launched in 2009. The project involved scientists from ICARDA and National Agricultural Research Systems of Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and China. It built on the notion that the majority of the rural population in Central Asia rely on agriculture and that climate change could negatively affect rural livelihoods. In particular the project focused on climate change effects on wheat production and productivity. The results obtained from 18 sites across the Region showed a generally positive impact of climate change on wheat productivity in Central Asia.

The results of the project, and issues that arose from its implementation, led to launching a new similar project in 2012. Under the new project aimed at investigating climate change effects on cropping systems, a training seminar, Crop modeling using CropSyst, was held from 17 to 21 December 2012 in Tashkent, Uzbekistan. It was attended by 19 researchers from nine institutions, including the Kazakh Research Institute of Soil Science JSC (Kazakhstan); the Kyrgyz Research Institute of Husbandry (Kyrgyzstan); the Horticulture and Vegetables Institute of TAAS (Tajikistan); the Centre of Genetic Resources of TAAS (Tajikistan); the Husbandry Research Institute of TAAS (Tajikistan); the Research Institute of Irrigation and Water Problems (Uzbekistan); the Uzbek Cotton Research Institute (Uzbekistan); the Kashkadarya SRI for Breeding and Seed Production of Cereal Crops (Uzbekistan); and ICBA. The theoretical part of the course content covered some basics of modeling in natural science and crop modeling in particular; different aspects of basic crop growth; effects of weather, soil hydraulic properties, soil salinity, soil organic matter, nitrogen and management on crop productivity. Thus, Dr Mariya Glazirina and Mr Tulkun Yuldashev, of ICARDA-CAC, gave lectures to the attendees on these topics. During the practical exercises, the participants had an opportunity to learn about the CropSyst model and carry out their own simulations.



*Dr Mariya Glazirina assists participants in using CropSyst model. Photo by Tulkun Yuldashev.*

Input data for CropSyst was obtained using VegMeasure, a computerized vegetation measurement program that allows charting or mapping vegetation using photographs taken vertically downward. This

open-source software, recently used for an ICARDA project, helps to measure foliar cover, that is the amount of foliage, and avoid hand charting of vegetation and Green Leaf Area Index techniques; requires considerably less amounts of effort and time; and could aid in crop modeling studies for most field crops (wheat, cotton etc) in Central Asia.

During the course, the participants also extensively discussed whether the CropSyst model was suitable for solving different scientific and practical problems in agriculture. They expressed interest in the technique and willingness to use the model in their research projects. At the same time they noted their interest in more advanced training in the future.

Considering that regional studies of cropping systems and the impacts of climate change rely on crude assumptions on the biophysical characteristics of crops, soils and climate as well as the agronomic management practices in the Region, training seminars like this one are of particular help to researchers in Central Asia. They learn how to make their own simulations of crop production more methodological and systematic, and thus how to increase yields of various crops. The software can also be used by postgraduate students doing agricultural research at universities.

### Regional training aims at better fodder, food supply in Central Asia

Land degradation and sustainable water resources management are important areas of agricultural research worldwide, and are of particular concern in Central Asia. A number of international research institutions study these problems in the region. Among them are the International Centre for Biosaline Agriculture (ICBA), the International Center for Agricultural Research in the Dry Areas (ICARDA) and the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT). They work to find solutions to prevent degradation of soil and water resources, and new ways of increasing crop productivity and resistance to negative environmental factors. One of the promising research areas is the diversification of agro-biodiversity by using alternative, well-adapted, salt- and drought-tolerant crops in farming in marginal lands. Thus, diversification makes it possible to cultivate better adapted species to water and soil salinity such as sorghum (*Sorghum bicolor*) and pearl millet (*Pennisetum glaucum*) instead of traditional crops like cotton, wheat etc. Their use has two main advantages: first, it will help to create a stable grain production and fodder supply for developing a local livestock feeding system, and second, it will help to prevent erosion and improve soil productivity.

In response to these opportunities, ICBA together with ICARDA and ICRISAT initiated a new project in 2011. The main national partners are the Uzbek Research Institute of Karakul Sheep Breeding and Desert Ecology, the Agricultural Research and Production Center under the Ministry of Agriculture and Water Resources of Uzbekistan, and the Rice Institute in Karakalpakstan and the Gulistan State University. The project, "Diversification of crops of sorghum and pearl millet to improve food supply and well-being of livestock farmers in Central Asia", is being implemented from 2011 to 2014 and is funded by the Islamic Development Bank. The aim of the project is to improve rural livelihoods and food security by using marginal lands in Kazakhstan, Tajikistan and Uzbekistan and applying principles and practices of biosaline agriculture to achieve sustainable land and water resources management.

As part of this project, the partner institutions periodically arrange training sessions and workshops for researchers and farmers in the region.

A regional training workshop on "Seed production and maintenance of technologies packages for sorghum and pearl millet in Central Asia" took place on



*Dr Kristina Toderich (ICBA) explains technology for soil and ground water salinity monitoring. Photo by Yuriy Nam.*

2-5 October 2012 in Tashkent, Uzbekistan. The event was attended by 45 participants, including project partners from Uzbekistan, Tajikistan and Kazakhstan, farmers, plant breeders, biotechnologists, livestock keepers, researchers and local officials.

The workshop aimed to promote highly productive sorghum and pearl millet cultivars, crop management technologies and development of an appropriate seed production system of these valuable cereals in marginal areas in each country. The program of the workshop included theoretical and practical elements. From a practical point of view, the introduction and testing of sorghum and pearl millet is intended to meet growing demand for quality seeds of these crops, which are well-adapted to local conditions, as well as the development of recommendations on crop management technologies packages and a crop-livestock productivity system, which would improve the skills of local scientists and farmers. In this context lectures were given by Drs Shoaib Ismail, Abdulla Dakheel, Belhaj Makhram, Kristina Toderich from ICBA, Dr Zakir Khalikulov from ICARDA-CAC and main partners from each country.

A field training day was held on Bayavut farm in Syrdarya Region in Uzbekistan, where the participants were briefed on the two-year results of developing land and water management practices for promising genotypes of sorghum and pearl millet in salt-affected farmlands. Dr Tadjiddin Kuliev, Uzbekistan, introduced the participants to irrigation with low quality water, irrigation and fertilizer treatment for two promising genotypes of sorghum and pearl millet, and other crop and soil management practices tested in the field.

Positive results were shown on cultivation of sorghum and pearl millet as second crops after wheat harvesting. Local farmers from Syrdarya Region, who attended the training seminar, showed interest in cultivating pearl millet. Mr Kakhramon Halikberdiev, deputy head of local government, and Mr Gafurjon Aliev, chief livestock husbandry official of Bayavut district, emphasized the importance of the project in Uzbekistan and capacity-building with focus on knowledge dissemination. Farmers should receive more training and consultation, they pointed out.

At Samarkand State University, the participants were introduced to various aspects of the sorghum and pearl millet seed production system (technology of cultivation, seed maturation stages, seed quality monitoring and optimal conditions for seed storage). Practical sessions were led by Drs Belhaj Makhram, Kristina Toderich and Shoaib Ismail, of ICBA. The meeting noted that seed multiplication trials, access of farmers to high quality seeds should become key areas for improving sorghum and pearl millet production in marginal lands in Central Asian countries.

The workshop ended with a discussion of issues relating to the sorghum and pearl millet project, including constraints, a summary of key achievements in 2011-2012, and action plans for each country for the coming year. The workshop had an important role in spreading knowledge and best practices in agriculture among researchers and farmers. They will continue to contribute to improved use of soil and water resources, and ultimately increase crop productivity and improve food security.

## Training of young researchers in producing high quality wheat seed

Wheat production directly influences food security in Central Asia. The region of Central Asia experiences frequent scourge of wheat yellow rust resulting in huge loss to the farmers. Cultivation of resistant varieties offers economically sustainable and environmentally friendly strategy to manage the disease. Through collaboration among national wheat improvement programs and international agricultural research centers ICARDA and CIMMYT, a number of yellow rust resistant varieties have been released in Central Asia in recent years. However, their cultivation is limited due to a lack of strategy on accelerated seed multiplication and varietal out-scaling. Recently, under funding support of the CGIAR Research Program (CRP) Wheat, a research project, "Accelerating Adoption of Yellow Rust Resistant Winter Wheat Varieties in Central Asia", has started in Uzbekistan and Tajikistan. Within the scope of this new project a training course, "Production and Quality Testing of Wheat Seed", was jointly organized by Kashkadarya Research Institute of Grain Breeding and Seed Production (KRIGBSP), ICARDA and CIMMYT from 2 to 12 December 2012 in Karshi, Uzbekistan. Seventeen young wheat researchers participated in the training course. The major contents of the training included process of seed formation and development,

considerations in producing high quality seed in the field, laboratory testing of seed quality in terms of genetic purity, germination and vigor, seed health and the system of production, quality testing and certification of wheat seed in Uzbekistan. The classroom lectures, lab demonstrations and practical experiments were organized during the training. The course was delivered by a number of specialists from different organizations. This included Prof. Amir Amanov from Uzbek Scientific Production Center, Prof. Nasreddin Khalilov from Samarkand University, Dr. Zokhid Ziyadullaev from KRIGBSP, Dr. Saidalim Gaybullaev from Gallaral Research Institute, Dr. Kakhramon Turakulov and Ms. Nataliya Tsay from National Seed Laboratory. Dr. Zakir Khalikulov, Dr. Ram Sharma and Dr. Dinara Muzafarova from ICARDA, Tashkent made presentations, organized experimental work and facilitated the course sessions. This training provided the young researchers with knowledge on recent developments in the field of seed science. The 11-day duration of the training gave the participants an opportunity to complete the experiments in evaluating seed germination and seedling vigor of a number of samples, and separate superior from inferior seed lots. In the closing session, plans and prospects for collaboration in wheat breeding research were reviewed. KRIGBSP demonstrated its institutional commitment in terms of available human resources and up-to-date research infrastructures, and the young researchers were encouraged to continue efforts in adopting research methodology and language skills. The importance of this training event for broader capacity development in Central Asia was highlighted.



*Participants during laboratory exercise, Kashkadarya Scientific Research Institute of Breeding and Seed Production of Cereal Crops. Photo by Dinara Muzafarova.*

## Better fiber for higher household incomes

“Improving Livelihoods of Small Farmers and Rural Women through Value-Added Processing and Export of Cashmere, Wool and Mohair” is a project funded by International Fund for Agricultural Development (IFAD) and implemented through ICARDA. It focuses on defined needs of households in order to improve their livelihoods and income putting special emphasis on rural women through improved production, processing and export of value-added fiber in producing areas of Tajikistan, Kyrgyzstan and Iran. The project efforts are aimed at addressing the key problems, including poor linkages to markets and lack of scientific, organizational and technical support for cashmere, mohair and wool producers to improve breeding and fiber quality. These constraints not only affect fiber quality but threaten the long-term competitiveness and sustainability of the sectors and the livelihoods of thousands of families who depend on incomes from fiber production and processing. Many of these families live in poor and often remote agro-ecological regions where the production of small ruminants such as Angora and Cashmere goats represents the only source of livelihood.

The project collaborators in the Khujand pilot site, northern Tajikistan continue their activities in mohair goat breeding. In addition to mohair processing, the Khujand project team also focused on developing a breeding plan for the autumn 2012 mating season. The objective was to inseminate selected nuclei females with frozen semen of American Angora bucks imported from Texas and establish production of quality breeding males at pilot sites.

The introduction of imported genetic materials is expected to speed up improvements in the quality of mohair, which includes elimination of kemp fibers, decrease in fiber diameter and increase in homogeneity and weight of mohair fleeces. Such improvements are expected to have a long-term positive impact on mohair marketing and processing. In particular improvement of mohair quality is expected to raise the value of local mohair on domestic and international markets, as higher quality fiber will be cheaper to process into yarns and textiles for export.

Artificial insemination (AI) of mohair goats in Tajikistan started in October 2011 upon imports of the

frozen American Angora goat semen. In 2011, collaborators managed to conduct insemination of 246 goats with frozen semen. This year the team continued its artificial insemination campaign with active participation and assistance provided by Mr. Ramin Aliverdi, AI Specialist, invited from Iran. From 3 to 25 October 2012, the project team selected 308 Tajik mohair goats out of the 1,056 goats owned by 9 farmers in Asht and B. Gafurov districts of Tajikistan. From these selected females, 250 does were accepted and artificially inseminated by the frozen semen collected from 7 American Angora bucks.



*Shepherd Tilobek from Khashkhorog village Tajikistan with Altai crosses born in 2011.*

*Photo by Liba Brent.*

Breeding program in Badakhshan (southeast Tajikistan) using Altai breeding bucks imported from Russia in 2010 to improve cashmere productivity of local goats is also expanding. In spring 2012, the

team collected data on the 2011 and 2012 Altai offspring. The results show that 73 kids from the Altai bucks were born in 2011, and 122 kids were born in 2012. The Altai/local crosses have the following characteristics: fiber color - white, grey and black; live weight at birth 2.3-2.9 kg and at the age of one year 14.9-19 kg; cashmere productivity varies between 324 gr. and 367 gr., (i.e. cashmere production in the first generation progeny exceeds its mothers by 2.6 and 3.0 times). This indicates considerable improvements in fiber productivity resulting from using the Altai fiber goat genetic material.

Other good news of the fiber project is the significant progress in fiber processing expected on the Badakhshan site. In November 2012, the project provided the processing women's groups by a carding machine. This equipment will help local artisans expedite Cashgora goat fiber processing and significantly improve the yarn and knitwear quality. The advantage of using this carding machine is that, from now on, women will be able to use the lowest quality fiber for production of the marketable good quality products, particularly the national Jurabe socks.

More information from the last project progress report is available on the project website at [http://www.cac-program.org/fiber/files/IFAD\\_1107\\_progress\\_report6\\_August2012.pdf](http://www.cac-program.org/fiber/files/IFAD_1107_progress_report6_August2012.pdf)

## Uzbekistan on course for more seed potato production

Potato is one of the staple foods in Uzbekistan. According to the national research organization sources, around 111,000 ha of agricultural land is currently used for potato cultivation (up from 65,000 in 2010), and it is expected to increase. But many farmers rely on seed potato imports as 95% of the cultivated varieties are of western origin. This has a negative effect on production costs. A calculation is simply made: to grow one hectare of potato 3.5 tons of seeds are needed, which, at the current price of \$US 2,000 a ton reaches a total cost of \$US 7,000 including transport at planting time. To at least partially meet the growing demand, an effective seed potato production system would need to be developed. Uzbekistan's annual need for quality seed potatoes is at least 110,000 tons according to some estimates.

Efforts are under way to deal with this challenge. National research organizations and the International Potato Center (CIP) have been working together to this end since 2005. In cooperation with the National University of Uzbekistan, CIP has been carrying out extensive research on seed potato production. A biotechnology laboratory, set up with CIP's support, is successfully operating to propagate disease-free in-vitro potato plants for experiments. It is also home to a collection of advanced CIP potato clones. The laboratory can produce up to 100,000 in-vitro plantlets a year. Furthermore, three aphid-proof screenhouses for in-vitro plant adaptation and minituber production of CIP-bred potato clones have been built on the premises of the National University of Uzbekistan. They provide the necessary help in conducting experiments. Knowledge gained in the laboratory and screenhouses is further applied in the field. A cultivation system for potato seed production was successfully tested at an altitude of 2,600 m in Tashkent Region using potato minitubers produced in the screenhouses. The outcome of this work was that three

advanced CIP-bred clones out of 80 were selected and released in Uzbekistan in 2010 and 2011. Most importantly, they are better adapted to long days and abiotic and biotic stresses. They also have more dry matter and are more marketable than other material.

These positive results have received government attention and support. Last year, the Academy of Sciences of Uzbekistan also joined the collaborative efforts on seed potato production by



*CIP-bred potato clone, registered in Uzbekistan as Sarnav, in field trials.  
Photo by Durbek Khalikov.*

the National University of Uzbekistan and CIP. The government of Uzbekistan has already allocated considerable funds for this work. There are plans to expand the laboratory and increase its capacity to 1.5 million disease-free in-vitro plants and potato microtubers a year. Also, an area of 1.5 ha will be allocated for the construction of a complex of screenhouses for minituber production, storage of seed potatoes, and other research activities. Some 200 hectares in the highlands at an altitude of over 1,800 m will be allocated for use in experiments and high-quality seed production. As part of joint cooperation, in 2013 there are plans to grow 270,000 plants from 46 in-vitro clones and several thousand genotypes issued from true seeds. All of these will be planted in Jizzakh Region at an altitude of 2,600 m to develop new promising clones. CIP also plans to give its national partners technology for detecting seed and soil-borne diseases and PSTV (potato spindle tuber viroid) to study their incidence in different regions. This research will help to identify the most suitable strategy for seed potato production. CIP is also sharing its experience with the development of dynamic seed potato production enterprises, which are considered to be a very effective channel leading to expected results. There are examples from many countries demonstrating that the dynamic private seed sector can take care of the management of the operations at any stage and be profitable. The recommendations formulated by CIP include the need to adopt proper seed legislation and a certification system consistent with international standards before starting seed potato production activities on a large scale. The endemic presence of a serious disease like PSTV, which is currently not considered in the local list of quarantine diseases, will make the production of good quality seeds risky.

The continued collaborative work with the national research organizations and other stakeholders, in particular with the emerging and dynamic private sector, will contribute to meeting the growing demand for seed potatoes in Uzbekistan. What is most important, farmers will have more access to considerably cheaper seed potatoes, which are well adapted to the local climatic conditions and of high quality.

## MISCELLANEOUS

### Ecological journalism on rise in Uzbekistan, helping to spread knowledge

#### *Birth of ecological activism in Uzbekistan*

Ecological journalism has a relatively recent history in Uzbekistan, but has nonetheless managed to carve itself a noteworthy niche in the national media landscape. It continues to gain momentum as the immediacy and significance of ecological issues facing the country draw public and government attention. Its primary function is to serve as a link between the wider public and various organizations involved in raising public awareness of environmental issues and promoting sustainable use of natural resources and preserving the environment. The field was born in Uzbekistan as a distinct area in the early 1990s. And ecological journalists have increased in their numbers since. Today their output is ever more present in

print, TV, radio, and increasingly online media in Uzbekistan.

As a result of budding media interest in the ecological agenda, the first issue of the Uzbek ecological publication Ecological Bulletin was published in 1995. This publication brought together a group of people dedicated to the issues of preserving the environment and communicating related issues to the wider public. A year later, the journal decided to establish the Chinor ENK [platan tree in Uzbek] ecological publishing company to increase its scope and meet steadily growing demand for ecological news and raising public awareness of existing and emerging ecological issues. It has gone from strength to strength since. In the past 17 years, the publication has undergone many changes. Its readership has grown, as has the number and quality of pages, articles and publications. To keep audiences abreast of the latest ecological news and events in Uzbekistan, Chinor ENK has also launched a web portal at [www.ekonews.uz](http://www.ekonews.uz). It provides information and news on various subjects, including renewable energy ([www.energy.ekonews.uz](http://www.energy.ekonews.uz)), waste management ([www.waste.uz](http://www.waste.uz)), and ecological education ([www.ekomaktab.uz](http://www.ekomaktab.uz)).

#### *State and foreign aid helps green journalism grow*

Today Chinor ENK brings together under the umbrella of ecological journalism various ecological movements and groups, news media and international organizations dealing with the environmental agenda. Since its inception the company has been carrying out various activities, including media training, seminars, workshops, jointly with its partners such as the State Committee for Nature Protection of Uzbekistan, the Organization for Security and Cooperation in Europe (OSCE) and more recently the International Center for Agricultural Research in the Dry Areas (ICARDA). The past two years have been very productive. In 2011 the non-governmental organization Ekomaktab [Eco-school] and Chinor ENK opened an information resource center in cooperation with the OSCE Project Co-ordinator in Uzbekistan. This center aims to help journalists and members of public to find up-to-date scientific, academic and other information materials on environmental matters. This has resulted in increased interest on the part of the media in these issues. Journalists attend workshops and seminars organized by different organizations. For instance, a journalist attended an ICARDA-organized regional travelling workshop on winter wheat evaluation in May 2012. Scientists from Uzbekistan and Kazakhstan took part in the workshop held in different regions of Uzbekistan. One of the most recent media training courses for journalists from all regions of Uzbekistan was organized by the OSCE Project Co-ordinator in Uzbekistan, Ekomaktab and the State Committee for Nature Protection in mid-December 2012.

#### *New award as stimulus*

As an additional incentive for the growth of ecological journalism in Uzbekistan, annual ecological journalism contests have been organized for the last 10 years. And the year 2011 saw the birth of the Qoplon [leopard in Uzbek] ecological journalism competition, which attracted over 300 writing samples from professional journalists and young ecological writers alike. Together with other foreign and national organizations, ICARDA has been actively involved in Qoplon's organization since 2011. Qoplon-2012 was no exception.

This year's contest was particularly fruitful and full of preparatory activities. The organizers arranged various events, press conferences, media tours, training courses and reviewed the submissions in the lead-up to Qoplon-2012. Submissions by veteran professional journalists along with young ecological reporters were a sign of Qoplon's growing prestige. Over 10 media tours were organized in 2012, which were both longer and more effective compared with the previous year. Furthermore, as part of the preparations for Qoplon-2012, the documentary film ECO-VIEW was screened.



*Journalists attended ICARDA's travelling seminar on wheat in spring in run-up to green media award 2012. Photo by Albina Bekmetova.*

In addition to training sessions for journalists at schools in the capital city of Tashkent, a summer school for young ecological journalists was organized.

To ensure the transparency and fairness during this year's selection process, the panel included the winners of Qoplon-2011. Representatives from organizations such as the United Nations Development Program – Global Environment Facility (UNDP-GEF) project in Uzbekistan, the Union of Journalists of Uzbekistan, the State Committee for Nature Protection, EKOSAN and Ekomaktab made up the panel. Dr Ravza Mavlyanova from World Vegetable Centre/ICARDA has been an active member of the selection panel.

Eleven months of the preparations and selection finally culminated in the Qoplon-2012 award ceremony on 14 December 2012. The event, held at Miran International Hotel in Tashkent, was organized by the State Committee for Nature Protection, the OSCE in Uzbekistan, Chinor ENK, EKOSAN and Ekomaktab. The ceremony was also supported by the Tashkent City Committee for Nature Protection, ICARDA and UNDP-GEF. There were eight awards categories such as Veteran Journalist; TV and Radio; Special Reporting Prize; Print Media; Young Journalist; Agro-ecology; Online Journalism; and Special Prize for Environmental Publication. During the ceremony, ICARDA's delegation awarded a special prize in Agro-ecology to a representative of the environmental publishing house Chinor ENK for their dedication to agricultural and ecological issues in Uzbekistan. Promising journalists Mamura Yokubova and Nesibeli Mambetirzaeva won in the Young Journalist category, which was introduced to encourage young people in ecological reporting. The Ecology and Health newspaper won the Environmental Publication nomination for its continued contribution to the coverage of environmental issues. Blogger Shakhnoza Turabekova was awarded a prize in the Online Journalism category for an interesting article on her blog. This ceremony was a fitting finale to all the work done by journalists in 2012.

#### *Outlook for environmental reporting*

This and similar events have been contributing to the dissemination of knowledge about environmental issues including more sustainable land and water management practices in the dry areas in Uzbekistan, and an increasing number of journalists are covering these issues in their reports today. Slowly but surely natural resource-saving approaches are rising high on the national media agenda. The number and quality of ecological news reports is on the increase too. Illustrative of this is interest on the part of communities and media outlets in regions, especially rural areas. But to maintain ecological journalism at this rate of development, continued support will be required of government agencies and local non-governmental organizations and funds. It is also important that international aid and development organizations play a role in this process. All this will facilitate the development of strategies and actions to tackle existing and emerging environmental challenges. Ultimately, this will stimulate public involvement in these issues and pave the way for reaching the goals of sustainable use of natural resources, improved environmental protection and better public health and nutrition in Uzbekistan.

## **Veteran Azerbaijani scholar turns 75**

On 8 January 2013, a leading Azerbaijani scientist, Professor Asad Jannat ogly Musaev, celebrated his 75th birthday.

Dr Musaev was born in Okhchuogly village in Armenia in 1938. After finishing a seven-year school in 1953, he enrolled at the Yerevan Azerbaijani College of Agriculture, which he graduated from with honors in 1957. He continued his education at the Institute of Agriculture in Ganja, which he graduated from in 1962 with a degree in agronomy. Between 1962 and 1964 he worked in the Baku land expedition under the Ministry of Agriculture as engineer in soil science, and later as chief of the expedition.



He received his PhD degree in agriculture in 1969 after having successfully defended his thesis. Between 1967 and 1979 he held various senior positions at the Azerbaijan Husbandry Research Institute. Since 1979 Dr Musaev worked as the director of the Institute until he was appointed first deputy director of the Center of scientific support for agriculture under the Institute.

In 1993, when he was head of breeding department at the Institute, he was also selected as head of the Variety Seeds Association under the Ministry of Agriculture. Later, Dr Musaev was appointed director general of the Elite scientific production association, which was formed from the Institute and the Variety Seeds Association in 1993. Following a Cabinet decree in 1999, the Agrarian Research Center was set up in Azerbaijan and Dr Musaev was chosen as its first director general.

During his professional career, Dr Musaev carried out numerous studies on crops and agricultural development. Under his leadership, the gene pool of several crops (wheat, barley, soybean, maize, chickpea, lentil, triticale, etc.) has been developed. These are widely used in breeding new varieties. Until now more than 100 new varieties of crops, including 31 by Dr Musaev, have been developed and submitted to the State Variety Testing Commission.

His fruitful work has been rewarded by a number of honors and medals, including a Badge of Honor in 1982. Dr Musaev is the author of many books and proposals such as The cultivation of cereals crops in Azerbaijan, Evidence-based farming system in Azerbaijan, Winter wheat cultivation with intensive technology, New varieties of grain crops and cultivation technology etc. He has written over 100 scientific articles on breeding, grain production and farming. He is also actively involved in international research partnerships. In particular, Dr Musaev has been associated with the CGIAR Regional Program for Central Asia and the Caucasus since 1994. He has also been the national coordinator and head of the National Agricultural Research System in Azerbaijan since 1999.

On behalf of the CGIAR-CAC Program we would like to congratulate Dr Musaev on his birthday and wish him success in his work, happiness and a long life.

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