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CACnews

This Issue in Brief:

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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.

EDITORIAL

Dear Reader,

This issue of CAC-News provides an overview of the events and activities that took place in the Regional Program from January to March 2011. It was prepared by the staff of the eight international agricultural research centers located and working together in Tashkent, Uzbekistan.

Due to lack of sustainable resource management practices, land is increasingly becoming marginal in Central Asia. Unless new use options are found, such land is taken out of the agricultural production. Growing renewable sources of energy would provide a new land use option, as it re-invigorates marginal, non-competitive land. The article on utilization of non-palatable biomass of halophytes (plant species adapted to living in a saline environment) from International Center for Biosaline Agriculture (ICBA) shows in some detail the example of research carried on halophytes in the CAC Region. The application of relatively low cost technologies for decomposition of halophytes and production of biogases would have a significant impact. It does not only imply lower dependence from gas supplies, but at the same time makes efficient use of marginal, otherwise unproductive land. Its realization would contribute to the diversification of agro-ecosystems and development of new agricultural capacities to increase income source of rural population and farmers, who often depend on traditional crops. Furthermore, cultivation of native wild halophytes on highly saline lands, which are typical for Central Asia, would also contribute to carbon sequestration by large scale biomass production.

Another example for an innovative, low-cost technology is briefly described in the article from CIP, the International Potato Center. In close collaboration with local research partners, the CIP team in Tashkent successfully tested and used aeroponics (process of growing plants in an air or mist environment) to produce disease-free seed potatoes. The objective of this research is to integrate the aeroponics approach in the potato-based seed system in Uzbekistan for the production of low cost certified disease-free minitubers in fewer generations than it is normally done.

A few new projects were lunched in the first quarter of the year. Among them, ICARDA in close collaboration with the Food and Agriculture Organization of the United Nations (FAO) started implementing a three-year research and field demonstration project on conservation agriculture in irrigated areas of Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan (see page 9). Conservation agriculture is a concept consisting of a set of practices that are simple to use and appropriate for farmers with different resource endowments. Their potential to give comparable or higher crop yields while saving resources, especially water, has been shown worldwide. Previous research in Central Asia demonstrated that zero or minimum tillage and raised bed planting techniques (key practices in conservation agriculture) are suitable for local conditions. The new project is expected to generate more knowledge and facilitate a larger-scale application of conservation agriculture than it is today.

As always, we welcome feedback and contributions from the readers.

Dr. Jozef Turok,
Head of CGIAR-CAC PFU,
ICARDA Regional Coordinator

IMPORTANT EVENTS

A group of US diplomats visit the IWMI office in Tashkent

Mr. Bruce Hudspeth, US Department of State Regional Officer for Environment, Science, Technology and Health in Central Asia, meets Mrs. Mastura Saifutdinova, IWMI's local counterpart.
(Photo by Bakhtiyor Mukhamadiev, US Embassy Tashkent)

The recent US Senate report appears to be putting water in Central Asia back on the policy agenda of the United States – in particular its transboundary dimensions. Shortly after the report was published (February, 2011) a group of US diplomats from a range of US embassies in Central Asia headed by Bruce Hudspeth, Astana Embassy's 1st Secretary and the Regional Officer for environment, science, technology and health in Central Asia visited different water organizations in Tashkent. One of the organizations visited was the International Water Management Institute (IWMI). The copy of US Senate report can be found at http://www.reliefweb.int/rw/rwb.nsf/db900sid/SNAA-8EBSP7?OpenDocument.

Prior to the meeting the group of US diplomats had visited one of IWMI's projects in Central Asia – the Integrated Water Resources Management in Fergana Valley (IWRM-Fergana), and met with the water users, its key beneficiaries (the water users) and implementers. Hearing of the positive outcomes of the project the US diplomats were interested in gaining greater insights new research and implementation ideas.

IWRM-Fergana project is funded by the Swiss Agency for Development and Cooperation (SDC) and implemented by IWMI in partnership with the Scientific Information Centre of the Interstate Committee on Water Coordination (SIC ICWC). In the current phase of the project IWMI is leading the component on Small Transboundary Tributaries (STTs).

The IWRM project team (Dr. Jusipbek Kazbekov, Dr. Kai Wegerich and Murat Yakubov) met with the US delegates on 2 March 2011 at IWMI's Tashkent office. After a brief introduction to IWMI's overall activities in the region, the US delegation was given a full presentation on experiences and approaches that were implemented in the IWRM-Fergana project as well as understanding the framework in which the STT component is being implemented. Under this component IWMI was able to establish transboundary cooperation on two STTs in the Fergana Valley: the Shahimardansai (shared by Kyrgyzstan and Uzbekistan) and the Khojabakirgansai (shared by Kyrgyzstan and Tajikistan).

Based on this meeting IWMI developed four different but inter-related start-up proposals which were submitted to the US Embassy in Tashkent.

Drs. Kai Wegerich, Jusipbek Kazbekov, Mr. Firdavs Kabilov, Mr. Murat Yakubov
IWRM-Fergana Project team, IWMI Central Asia office

Innovation developments in agriculture presented at UzExpoCentre

An innovative tomato grafting technique presented at UzExpoCentre
(Photo by Ravza Mavlyanova)

Innovation developments were presented at the National fair of innovation projects and ideas, which was held in UzExpoCentre of the Republic of Uzbekistan on 13-15 March 2011. Two innovative methods developed under the ICARDA-Michigan State University (MSU) in the framework of Integrated Pest Management – Tomato Package project were presented in cooperation with Tashkent State Agrarian University.

The rootstock grafting technique of local varieties of tomato to improve their resistance to diseases and increase yielding features in extreme conditions, introduced from AVRDC – World Vegetable Centre, has been mastered in Uzbekistan for the first time. The given method introduces wide opportunities for further development of the work on grafting of cucumber, pepper, eggplant, melon and watermelon for better adaptation of varieties and increasing production and quality of vegetables.

Application of biological methods in growing vegetable crops to increase quality and produce ecologically clean vegetables has a great potential in the country and elsewhere in the Region. For the first time, the studies on an entomophage [predatory arthropods and parasitic insects] (Amblisseus) conducted in cooperation with ICARDA-CAC, MSU, Tashkent State Agrarian University and Uzbek Scientific Research Institute for Plant Protection were presented during the exhibition. Propagation of this entomophage in the bio-laboratories provides farmers with an opportunity to grow better quality products and increase their income.

Dr. Ravza Mavlyanova, AVRDC-Tashkent,
Dr. Barno Tashpulatova, ICARDA-MSU Project

ICBA Director visited Tashkent

The Director of Technical Programs from ICBA Headquarters in Dubai, Prof. Faisal Taha, visited Uzbekistan on 30 March – 01 April 2001 with the purpose to evaluate activities of ICBA office in Tashkent and to meet key research stakeholders in Uzbekistan.

During his meeting with Dr. Jozef Turok, Head of PFU, CGIAR-CAC, Prof. Faisal Taha discussed current and future activities of ICBA as a member of the CGIAR Regional Program for Agricultural Development in Central Asia and Caucasus. Particularly, special attention was given to the new joint collaborative project on "Sorghum and Pearl Millet for Crop Diversification to Improve Crop-livestock Productivity and Farmers Livelihood in Central Asia".

At the National University of Uzbekistan Prof. Taha met with Prof. Azamat Azizov, Head of Department of Applied Ecology and Dr. Natalya Akinshina, Scientific Researcher and discussed achievements of the joint project on "Utilization of biomass of halophytes as renewable energy source", done in collaboration with the Kitakiyushu University (Japan). Today, the partners are working on the establishment of mini laboratory to continue studies on creation of industrial halophytes plantation on highly saline soils and utilization of halophytes' biomass for biogas production.

Prof. Taha also visited Tashkent State University of Economics, where he met with Prof. Dr. Bakhodir Begalov, Vice-rector responsible for scientific cooperation and Dr. Makhamatjon Kasimov, Director of the Integrated Innovation Center of the University, who highlighted the role of ICBA in introduction of biosaline technologies for reclamation of salt affected lands and promotion of underutilized high value crops.

Later Prof. Taha met with Mr. Abduvakkos Abdurahmanov, Head of Environment and Energy Unit of the UNDP Office in Uzbekistan. During the meeting it was agreed to jointly plan and implement project activities of mutual interest in collaboration with national partners and stakeholders, including capacity building activities and exchange of documents and scientific information.

On 1 April 2011 Prof F. Taha met with Dr. Amir Amanov, Director General of Scientific Production Center for Agriculture under the Ministry of Agriculture and Water Resources of Uzbekistan and Dr. Zakir Khalikulov, Deputy Head of PFU-ICARDA Program in Central and Caucasus. During the Meeting Dr. Amanov has showed great interest to develop collaboration with ICBA in the filed of introducing and evaluating of new salt tolerant germplasm, preferably on wheat as this is the key crop for Uzbekistan.

Dr. Kristina Toderich
ICBA-Tashkent

(Left to Right) Dr. Zakir Khalikulov, Dr. Amir Amanov, Dr. Kristina Toderich, and Dr. Faisal Taha
(Photo by Albina Bekmetova)

UPCOMING EVENTS

NATO workshop in Brussels

The International Water Management Institute (IWMI) and the EastWest Institute (EWI) are organizing the NATO Advanced Research Workshop: "From Joint Scientific Research to Sustainable Regional Cooperation on Water", on 29 and 30 June 2011 at EWI's Brussels Office.

The workshop will be hosted by the EastWest Institute – Brussels office and coordinated by Dr. Kai Wegerich, Researcher on Water Institutions and Policy, IWMI and Mr. Sayed Sharif Shobair, Water Expert Afghanistan.

The objective of the NATO Advanced Research Workshop is to highlight current ongoing cooperation efforts between the riparian states, namely Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan within the Amu Darya basin and to learn from the experience of ongoing efforts concerning joint research, data generation, bi-lateral cooperation, governance and networking initiatives.

For participation and more information please contact: Joelle Rizk, Program Coordinator Regional Security Program, EWI Network, EWI (jrizk@ewi.info) and Guljamal Jumamuratova, Project Assistant Amu Darya Basin (gjumamuratova@ewi.info).

RESEARCH HIGHLIGHTS

An innovative technology to produce disease-free seed potatoes tested in Uzbekistan

New aeroponic facility at Institute of Vegetables and Potato, Tashkent:
CIP advanced clones 396311.1 (on the right) and 395186.6 (on the left)
(Photo by Firuz Yuldashev)

In-vitro technology or tissue culture was commonly used in many countries to replace traditional clonal propagation. In order to speed up the process and reduce the time lag before seed potatoes are available to farmers, it is now gradually replaced by aeroponics in many countries. Aeroponics, or the process of growing plants in an air or mist environment without the use of soil or aggregate media, does not require large infrastructure facilities, unlike tissue culture or micropropagation.

Aeroponics has the following advantages:

- it is more cost-effective than other systems because less water and less nutrients are needed in the system at any given time compared to other nutrient delivery systems (i.e. hydroponics, tissue culture, etc.);
- the need for substrates (soil mixture) is eliminated resulting in reduced manufacturing and maintenance costs. This has important environmental implications because the production of minitubers under soil-less conditions reduces considerably the high cost of energy needed to sterilize large quantities of substrate as it happens in other seed production systems;
- the deleterious effects of seed stocks that are infected with pathogens can be minimized due to the separation of the plants and the absence of soil substrate;
- the high amount of minitubers produced by this technique allows a faster multiplication rate in seed programs and reduces the number of field generations needed, for instance, by the traditional clonal multiplication due to its extremely low multiplication ratio (1:6) compared with wheat or maize (1:200).

Details of roots with stolon primordia: 32 days after planting.
They receive a nutrient mist provided by nozzles that are distributed under the table.
(Photo by Firuz Yuldashev)

CIP-Tashkent, in response to a recent request to conduct research on the behaviour of some advanced clones under different climatic conditions (tropical, subtropical and temperate), set up a small facility for aeroponics in the premises of the Institute of Vegetables and Potato, Tashkent. This will allow investigating the feasibility of the system under local conditions. One of the major constraints is the high temperature during the growing season. It needs to be controlled by the installation of an air cooling system in order to favour tuber initiation and further growth. It is known, in fact, that a progressive reduction of tuberization is encountered when temperature increases up to 30°C. Once the system will be optimized, appropriate nutrient solutions, plant densities, number of harvests and harvesting intervals, as well as possible interactions between them will be investigated.

The medium/long-term objective is to integrate the aeroponic approach in the potato-based seed system in the country for the production of low cost certified disease-free minitubers in fewer generations than it is normally done, which in turn will be supplied to local seed growers for further multiplication. Pictures 1 and 2 demonstrate details of this innovative multiplication system. Sprouted minitubers from two CIP advanced clones (395186.6 and 396311.1) were planted in sand on 18 February 2011 and plantlets transplanted in the final environment on 17 March (picture 1). Mr. Durbek Khalikov, CIP Assistant, and local collaborators from the Institute were the authors of the aeroponic system set up in Tashkent using locally available equipment, following instructions contained in a Manual for aeroponics available on CIP website on the following link: www.cipotato.org/csd/materials/archives/potato/PDFs/005447.pdf

Drs. Carlo Carli, Feruz Yuldashev, Mr. Durbek Khalikov
CIP-Tashkent

New varieties of vegetable crops

Cooperation of national agricultural research systems (NARS) with AVRDC – World Vegetable Centre is being carried out within the framework of Regional Network for Vegetable Research and Development. Under the project “Regional variety trials of vegetable crops” the studies on germplasm, introduced from AVRDC – World Vegetable Centre, are being conducted in all eight countries of the region. As a result of the studies conducted in partner institutions, scientists managed to selected advanced lines, which were submitted for State variety trials.

Currently, more than 20 lines of 5 variety crops undergo State variety testing in Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. For the period between 2007 and 2011, 18 new varieties of vegetable crops having unique traits with high economic potential in the region (precocity, crop capacity, disease resistance, fruit shape and color originality), went through State registration procedures.

Varieties of tomato Zeytun and Armine, of hot pepper Zspanak and Gita, of sweet pepper Natali were released in Armenia. Varieties of hot pepper Pikant and sweet pepper Kaz-Tay and Bayan were released in Kazakhstan. There are 10 varieties released in Uzbekistan, including: vegetable soybean Ilkhom, Universal and Sulton; mung bean Marjon, Zilola and Durdona; hot pepper Uchkun and Tillarang; yard-long bean Oltin Soch; colewort Shark Guzali.

Farmers gladly begin growing new varieties of vegetable crops, which contribute to the expansion of the diversity of vegetables, enrichment of diet, and diversification of farmers' income.

Dr. Ravza Mavlyanova
AVRDC-Tashkent

New varieties of vegetable crops are growing in farmers' fields
(Photo by Elbek Suleymanov)

Soil diagnostic techniques for improving tomato crop production in Uzbekistan

Crop production requires a range of inputs such as use of fertilizers, water, reduced pesticide use, and advanced biological control for plant protection. Failure to conduct these activities may lead to soil degradation, pollution of air and water, contaminated fruits and vegetables, greater pest damage and undue increase in crop production costs.

Various diagnostic techniques enabling the plant-growers to rationally use inputs for increasing crop capacities are available today, along with information on soil improvement activities. Rational use of materials necessary for crop production can make for complete elimination of all kinds of harmful effects, as well as reduce the unit cost of harvest. Timely use of diagnostic techniques prompts plant-growers to intelligent use of different components, including Integrated Pest Management (IPM) methods.

Soil analyses laboratory at the Institute of Microbiology (Tashkent)
(Photo by Gulnara Djumanyiazova)

The scientific data on crop production for the last 100 years demonstrate that soil study should be a starting point for application of IPM measures. Soil is a complex natural material, consisting of mineral and organic matter, air, water, and organisms supporting plant growth. Many of these properties may differently affect crop production, most of which could be effective and help plant growers to easily modify the soil.

Thus, one of diagnostics methods required for farmers in crop production in Central Asia is soil testing. Testing soils before crop planting allows the plant-growers to identify the physical and chemical characteristics of soil to create ideal conditions for plant's growth. Soil tests for presence of different types of salts, minerals, organic matter and pH are conducted in the laboratory of the Institute of Microbiology of Uzbekistan Academy of Sciences by using diagnostic methods.

To identify what kind of fertilizers and preparations (organic matters) is necessary to be applied a soil sample analysis was conducted in the greenhouse located in a private farm named «Jasmina-Azizbek», Tashkent region (Uzbekistan) before planting tomato sprouts. Soil samples were collected from arable soil layers (0-20cm in depth) and placed into small sterilized plastic boxes. Such microorganisms as ammonificators, oligonitrophils, phosphorus mobilizing bacteriums, micromycetes and actinomycetes were identified by conventional methods using different kinds of agarized mediums. Agrochemical analyses were conducted according to methods given in recommendation books, published by Uzbekistan Academy of Sciences, Tashkent, 1999 and 2005. Meanings of pH – hydrogen indication of soil water suspension were determined by standard pH meter. Humus content was detected by Turin's method, gross form of nitrogen and phosphorus content were analyzed according to Ginzburd's method, active ammonium $N\text{-}NH_4$ and P_2O_5 contents were determined by colorimetric method, and content of exchangeable potassium K20 were determined by flame photometric method.

According to the data obtained during the diagnostics, it was estimated that the tested soil is an alkaline gray desert (serozem) in texture. The soil of this area was damaged as a result of growing monoculture (tomato and cucumber) and regular use of chemicals (fertilizers, fungicides, insecticides etc.) over several years. Soil analyzes made at the Institute of Microbiology showed that the soil from the experimental plot, according

Dr. Higa's (Japanese scientist who discovered preparation of effective microorganisms) definition, belong to disease-inducing soils which contain pathogenic microorganisms, such as Fusarium sp., which often comprise a significant proportion of the microbial population (up to 20%). Moreover, alkalic pH levels and presence of big amount of insoluble heavy salts indicate the need for soil to be recovered with different types of inputs. According to Dr. Higa's concept, around 90% of agricultural land worldwide can be classified as having disease-inducing soils and, as he noted, in these soils the addition of high-N organic matter (i.e. fresh manure) leads to incomplete oxidation and results in malodorous and plant toxic substances. Additionally, these soils are characterized as having poor physical properties (i.e. compaction) and many plant nutrients exist in immobilized and insoluble forms. Besides low content of major microelements (K, Ca, Mg) this soil also lacks the ability to retain nutrients and water. Crop will not perform well on this soil without the proper application of necessary fertilizing and watering activities.

In conclusion, proper and frequent application of fertilizers, such as organic matters (effective beneficial microorganisms) and minerals, including gypsum and lime (in case of drip irrigation) can allow satisfactory tomato production in the greenhouse.

Dr. Barno Tashpulatova, ICARDA-MSU Project
Dr. Gulnara Djumanyiazova, Institute of Microbiology, Uzbekistan Academy of Sciences

Utilization of non-palatable biomass of halophytes as a valuable source of renewable energy production to meet demands of rural communities in Uzbekistan

Wild bushes of halophytes (Climacoptera lanata) in Central Kyzylkum
(Photo by Kristina Toderich)

Recent investigation conducted by ICBA in Central Asian region have shown the benefits of cultivation and sustainable utilization of wild and/or domesticated halophytes and salt-tolerant crops for salinity control, remediation of saline lands and improving soils fertility, consequently diversifying the incomes of rural communities. It is known, that many halophytes are used as forage, grain, fodder, technical, and medicinal plants. Until recently, no major research efforts had been made in Central Asia on the utilization of non-palatable biomass of halophytes.

It was revealed that halophytes contain very high concentrations of mineral compounds (about 40-50% of dry matter (DM)) in contrast to conventional grass (5% of DM). It confirms that they provide significant aboveground biomass source and can remove large amounts of various salts from saline environment and accumulate them in plant tissues. Due to high content of mineral salts, the aboveground plant biomass could not be used as forage. Therefore, this non-palatable biomass has been suggested to be utilized both for biogas production and other products (bio-fertilizers, bio-humus and technical salt).

In 2010 Dr. Natalya Akinshina, leader researcher, Department of Applied Ecology of National University of Uzbekistan (NUU) in collaboration with Dr. Kristina Toderich, ICBA-CAC obtained a grant from the Municipality of Kitakiyushu city, Japan, to implement individual research project "Utilization of biomass of halophytes as renewable energy source". A lab-scale anaerobic degradation of three wild growing halophytes (Kalidium caspicum, Salicornia europaea and Climacoptera lanata) from highly saline biotopes of Kyzylkum desert compared with conventional glycophyte Panicum coloratum (as a control) were conducted for a period of 6 months under leadership of Professor Hidenari Yusui, at the Faculty of Environmental Engineering, Kitakiyushu University, Japan. Tests were operated under batch mode at Food to Microorganisms ratio (F/M) of 0.2 with seeding microorganism of 17.3 g COD/L (chemical oxygen demand for 1 litre) taken from anaerobic digestion facilities of municipal sludge in Japan.

Tests were operated under batch and continuous mode at mesophilic (M) and thermophilic (T) temperatures. High content of chlorides, sulphates, sodium and potassium and low concentrations of nutrients were revealed. Batch-tests on three typical wild halophytes, Climacoptera lanata, Kalidium caspicum and Salicornia europea compared with salt sensitive grass, Panicum coloratum showed that total methane-yields at M and T conditions were similar. Under laboratory conditions maximum bio-gas was produced through the anaerobic degradation of K. caspicum (about 1000 mL of methane (CH4) , while P. coloratum digestion produced less than 900/800 mL/L. Obtained results revealed that 72-90% organic fraction of K. caspicum can be decomposed to CH4 at 35ºC within 30-days. At T-conditions about 45-70% organic matter of plant biomass were conversed into methane. Incubation at 55ºC accelerated the CH4 conversion rate up to 2 times. Time differences in the anaerobic decomposition of the halophytes are related to the variation

of lignin content, different nutrient concentrations and chemical compounds of plant biomass. Preliminary study of anaerobic digestion of plant biomass under continuous mode demonstrated that it is possible to obtain about 300-500 mL CH4 from 1L of anaerobic digestion sludge per day.

The above-mentioned technology is most suitable for agri-pastoralists and herders, who live in remote desert and semidesert areas. Integration of crop-livestock farming system and cultivation of wild succulent halophytes on waste, abandoned, moderately to highly saline lands contribute to their rehabilitation and improve soil fertility. Since such categories of lands are not suitable for cultivation of traditional crops, the promotion of halopytes in industrial plantations for biofuel production will not induce competition with grain cereals. Investing in renewable sources of energy will address the traditional shortcomings of degraded dryland areas in the region, which have been suffering from constant nutrient mining and increasing of soil salinity, particularly in low river deltas – over the past few decades. This is particularly important as agriculture is the main economic activity in every Central Asian country, but production is far below the potential yields and revenues, and below the possible resource efficiency levels.

It has been shown that planting pure stands of halophytes or mixed with trees/shrubs and winter/summer grasses actually improves the soils by removing salts and increasing organic matter, so that rotational systems can be envisaged in the long term. This means that industrial plantations with halophytes are rotated through tree/shrubs/grasses plantations on communities' land in order to gradually improve them. The created windshield protects neighboring areas from salt/dust storms, which occur in the region.

Further steps of ICBA-NUU–Kitakiyushu University collaboration include the establishment of a minilaboratory to continue studies on biodegradation of halophytes. Starting equipment has been delivered by University of Kitakiyushu to achieve this purpose.

Drs Kristina Toderich, ICBA-CAC
Natalya Akinshina, National University of Uzbekistan

Lab equipment for producing biogas through anaerobic degradation of halophytic plants
(Photo by Natalya Akinshina)

MEETINGS

National Steering Committee of UNEP-GEF project on "Fruit Crops and Wild Fruit Species in Central Asia"

The Sixth meeting of National Steering Committee of Bioversity International/ UNEP-GEF project "In situ/On farm Conservation & Use of Agricultural Biodiversity (Fruit Crops & Wild Fruit Species) in Central Asia" was held in Uzbekistan on 9 February 2011. The main objective of the meeting was to review the project progress made in Uzbekistan in 2010. Results of work on policy and legislation; results of expeditions, inoculation works; and main financial expenditures in 2010 were presented during the meeting. Reports on implemented activities on components "Public awareness", "Broad Participation and Strong Partnerships", "Capacity Building" were provided to participants. As a result of the meeting, recommendations and proposals for further implementation of project activities in 2011 in Uzbekistan were put forward and approved. Draft budget for 2011 was reviewed; work plan, budget and monitoring plan for 2011 were adjusted and approved.

Dr. Muhabbat Turdieva
Bioversity International-Tashkent

NEW PROJECTS

Inception Workshop of the Project on "Conservation Agriculture in Irrigated Areas of Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan"

A two-day Inception Workshop was held on 31 January – 1 February 2011 in Tashkent under the FAO/Turkey Partnership Programme (FTPP), with the technical support of ICARDA Regional Office in Tashkent.

The workshop focused on the following objectives: a) Discussion of the detailed national and regional work plans of the project; b) Obtaining inputs and suggestions

Planting crops on old furrows using minimum tillage method
(Photo by Aziz Nurbekov)

Wheat sprouts growing after minimum tillage.
(Photo by Aziz Nurbekov)

from the participants regarding the conservation agriculture in the countries involved in the project; and c) Considering proposals and options for the nonexpendable equipment. The Inception Workshop was attended by experts from FAO, ICARDA, JIRCAS, ZEF-project, vice rectors of Agricultural Universities of Uzbekistan and National project coordinators and consultants from Azerbaijan, Kazakhstan and Uzbekistan. Overall, 40 participants from the 3 countries of Central Asia and Azerbaijan participated in the workshop.

The opening session was chaired by Prof. Shermat Nurmatov, Deputy Minister of Agriculture and Water Resources of the Republic of Uzbekistan. Prof. Nurmatov, Dr. Theodore Friedrich, Senior Officer of FAO Plant Production and Protection Division (Rome, Italy) and Dr. Jozef Turok, Head of PFU and ICARDA-CAC Regional Coordinator, made welcome speeches in the opening session, underlining the importance of conservation agriculture in Central Asian countries and Azerbaijan. It was noted that the project starts very timely, as farmers in Central Asia are now becoming increasingly aware of conservation agriculture as a new, promising concept. It was agreed that this new project will make a contribution towards introducing the concept of conservation agriculture in the region.

Key note speakers and resource persons made presentations during the second session of the Workshop. The presentation "Status, challenges and perspectives of conservation agriculture in Central Asian countries" was delivered by Dr. Theodore Friedrich. This was followed by the presentations of Dr. Rachid Serraj, Program Director, ICARDA – "ICARDA's research strategy on sustainable intensification in the dry areas", by Ravi Gopal Singh, Agronomist (ICARDA) - "Conservation Agriculture in Wheat-based systems in Central and West Asia and North Africa (CWANA)", by Dr. Jozef Turok, Regional Coordinator ICARDA-CAC - "ICARDA's approach to implementing Conservation Agriculture in Central Asia" and by Dr. Aziz Nurbekov, Project Regional Coordinator (ICARDA-CAC) "No-till wheat yield as related to soil moisture content and manure application at different rates". Three national project coordinators from Azerbaijan, Kazakhstan and Uzbekistan also made presentations on project activities in their respective countries. Dr. Hafiz Muminjanov, Plant Production and Protection Officer, FAO/SEC (Ankara, Turkey), made an introductory presentation to the project on the topic "Conservation Agriculture for Irrigated Areas in Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan".

Dr. Aziz Nurbekov then presented the work plan based on the project document. The project work plan was discussed in detail including issues related to improving crop production and management through conservation agriculture, cropping system diversification, economic analysis and capacity development. A majority of the participants representing various countries and agencies provided their valuable inputs in relation to the project regional and national work plans. The participants reaffirmed the need for wider introduction of conservation agriculture practices in the region, which was reflected during the discussion sessions after each presentation. The interaction during the discussion sessions was very lively. The participants appreciated FAO's and ICARDA's efforts in conservation agriculture in Central Asia and Azerbaijan.

Drs. Aziz Nurbekov and Jozef Turok
ICARDA-CAC

WORKSHOPS AND TRAININGS

Establishing Water Committees – a participatory Governance structure on the Kyrgyz parts of Small Transboundary Tributaries (STT)

As was reported in the previous issue of CAC news (No 45-46, July-December, 2010), IWMI had been facilitating a series of stakeholder consultations towards joint water governance in two river basins – the Khoja-Bakirgansai and the Shahimardansai. The two rivers are small transboundary tributaries of the Syr Darya, each shared by two countries. In both cases Kyrgyzstan is upstream and either Tajikistan or Uzbekistan are downstream. The activities at these two rivers are part of the bigger IWRM-Fergana Project that IWMI has been implementing since 2001 in association with its regional partner, the Scientific Information Centre of the Interstate Commission for Water Coordination in Central Asia (SIC-ICWC). The IWRM-Fergana Project is funded by the Swiss Agency for Development and Cooperation (SDC).

Two stakeholder workshops were conducted on the Kyrgyzstan side of the two project rivers with the aim of establishing water committees. A water committee is a joint public and state body to govern the hydrographic maintenance units, which were established earlier in the project. These committees are the final element of the applied model of institutional reform, under which the state water department is in partnership with water users (the project also established water users' representative organization – Union of water users). They mutually manage the river and irrigation system through governing the operational unit.

Two Water committees were established during two sequential workshops conducted in Leylek Part of the Khoja Bakirgan Sai and in Kadamjay part of Shahimardan Sai STT on 25 and 26 January 2011, respectively.

The events were organized by a team of 8 practitioners and professionals from the Osh Province of Kyrgyzstan. The focus of this initiative was to make available local experience, to replicate the significant progress of the Osh team for the last 8 years with the Aravan Akbura Main Canal, as the key pilot and pioneering point. A few days prior to the events, IWMI researchers conducted the training of trainers exercise for the Osh team to make sure that main concepts and formats are aligned with the local needs and specifics, since each of the small transboundary tributaries has its own requirement and small tributaries are very different compared to reservoir commanded main canals. The facilitation assignment included a framework to lead the consultation and agreement process.

The team from Osh Province included provincial water managers and chairs of their water committee, representatives from the canal management organization and representatives from the union of water users of the Aravan-Akbura Main Canal system. Backstopping from the Osh team, relevant local expertise and experience sharing made the two workshops more efficient and fruitful than if they had been conducted without local experience. At the two meetings 35 and 32 local stakeholders participated in Leylek and Kadamjay, respectively. These stakeholders mainly represented the Batken Province water department, relevant district water management organizations, water user associations, maintenance units and water users, e.g. farmers. The workshops achieved very positive results. It was possible to sign management transfer agreements between the state and the water users, to elect board members and to agree on the chairpersons of the water committees.

To quote one speaker in the event to emphasize the role of public participation 'expected favorable conditions are achieved through public involvement into water management, while control of how water users' needs are met facilitates best results'.

Drs. Kai Wegerich, Jusipbek Kazbekov, Mr. Firdavs Kabilov, Mr. Murat Yakubov, IWRM Fergana Project team, IWMI Central Asia office

Specialized Training Course on Field Experimental Design and Analysis in Central Asia

Design and Analysis of experiments are essential components of research in agriculture and allied sciences. It is through the data collected from well designed experiments that valid inferences are drawn. In order to make research globally competitive, it is essential that sound statistical methodologies be adopted for the collection and analysis of data. Significant contributions have been made in the field of experimental designs. It is imperative to improve the quality of agricultural research and make the research competitive at international level through proper designing of experiments and using most suitable statistical analytical techniques. In this context, a training course on field experimental design and analysis was organized by the International Center for Agricultural Research in the Dry Areas (ICARDA) from 14 to 26 February 2011 in Tashkent, Uzbekistan.

Participants of the specialized training course
(Photo by Sherzod Qosimov)

The objectives of the course were to i) familiarize the participants with the concepts of design of experiments and analysis of experimental data; ii) acquaint the participants with the use of statistical software packages for statistical data analysis; and iii) help and advise active researchers in preparing a draft research manuscript for publication.

The participants of the course included nine young researchers from Azerbaijan, Georgia, Kazakhstan and Uzbekistan. The expert trainers were Dr. Murari Singh (Senior Biometrician) and Mr. Khaled El-Sham'aa (Scientific Software Engineer) from ICARDA, Aleppo, Syria. The course included theoretical explanations and practical exercises on basic statistical modules including planning, data analysis and interpretation of results using complete and incomplete block designs and Genstat statistical software.

This was the first opportunity for all the participants to attend and learn the principles and practices of field experimental design. The training course was started with the motivating speech by Prof. Amir Amanov (Head of NARS, Uzbekistan) who underlined the significance of the training course in relation to improving quality of agricultural research.

During the concluding session, Prof. Sherali Nurmatov (Deputy Minister of Agriculture and Water Resources, Uzbekistan) and Dr. Jozef Turok (Head of CGIAR Project Facilitation Unit and Regional Coordinator of ICARDA for Central Asia and the Caucasus) highlighted the value and application of the training course for the participants and their home institutions towards more efficient planning and management of agricultural research.

The trainees were highly appreciative of ICARDA's initiative on organizing such a practical training which will directly benefit them in improving the quality of their research outputs.

The training course was organized within the framework of an ongoing research project, "Utilization of Wild Relatives of Wheat in developing salinity tolerant winter wheat with improved quality for Central Asia" undertaken in Central Asia by ICARDA under funding support from BMZ/GTZ.

Dr. Ram Sharma
ICARDA-CAC

IWMI holds a research experience sharing workshop with the TIIM graduate students

Experience sharing workshop for TIIM graduate students
(Photo by Sanjar Khojaev)

IWMI and the Tashkent Institute of Irrigation and Melioration (TIIM) conducted a research experience sharing workshop for TIIM's Department for Graduate Studies. The event targeted TIIM's 4th-year MSc and PhD students with the objective of assisting these post graduate students in formulating their research topics. The workshop was held on 2 March and focused on exposing graduate students to IWMI's research as well as providing them with some insights into formulating and conducting research. The event was attended by TIIM management and dozens of graduate students from various irrigation disciplines. TIIM was represented by Dr. Kodirjon Shavazov, Mr. Avazbek Kamalov, Mr. Odil Akbarov, Mr. Sanjar Khojaev and Mr. Ikrom Avazov. Drs Kai Wegerich, Jusipbek Kazbekov and Mr. Murat Yakubov represented IWMI.

Of particular interest to the audience was the presentation by Dr. Kai Wegerich of IWMI who shared his thoughts and experiences as how to critically formulate and conduct research in a real world context. A number of possible research topics and puzzles were proposed and discussed at length to provide real life examples and to enhance students' attention and interest. Among other things these included such topics as feasibility of hydrological boundary-based management in relation to ongoing irrigation management reform in Central Asia, the importance of interaction and interdependence of water control dimensions (technical, organizational, socio-economic and political), current practices of water distribution and strategies for using different water sources within local rural neighborhoods – mahallas.

This was followed by a lively and open discussion with the students regarding their interests, plans and intentions to conduct field research in order to support their thesis and diploma works. Both the students and the TIIM administration acknowledged the usefulness of the experience sharing event and expressed their willingness to further develop research cooperation ideas between TIIM, its students and IWMI.

Drs. Kai Wegerich, Jusipbek Kazbekov, Mr. Firdavs Kabilov, Mr. Murat Yakubov,
IWRM Fergana Project team, IWMI Central Asia office

Water Productivity Improvement at Plot Level (WPI-PL) project contributes to effective water management practices in Fergana Valley

The Water Productivity Improvement at Plot Level project (WPI-PL), funded by the Swiss Agency for Development and Cooperation (SDC) is implemented by International Water Management Institute (IWMI), Scientific Information Center of the Interstate Commission for Water Coordination (SIC-ICWC) and National Partners with activities in three countries of Fergana Valley: Kyrgyzstan, Tajikistan and Uzbekistan. The project objective is to strengthen the capacity in terms of knowledge, extension material and methods of different actors in the agricultural innovation system through strategic

alliances for disseminating solid and adapted extension messages related to water productivity improvement at the farm plot level. The WPI-PL project focuses on the generation, transformation and dissemination of water-related knowledge to improve crop and water productivity at farm/plot level.

WPI-PL project conducted its annual stakeholder's workshop in Tashkent on 11 March 2011. More than 45 people participated from Kyrgyzstan, Tajikistan and Uzbekistan, which comprised of representatives of Kyrgyz Water Committee, Water and Melioration Ministry of Tajikistan, Ministry of Agriculture and Water Resources of Uzbekistan, SDC, SIC-ICWC, IWMI, National Research Institutes, Information Centers of the project and disseminators. Moreover, representatives from SDC and a World Bank financed RESP-2 project also participated in the workshop.

The main objective of the workshop was to provide an overview of achievements of the project to the donor and key stakeholders and discuss with project partners the Annual Action Plan. During the meeting, project leaders Dr. Mohan Reddy Junna, IWMI-Tashkent and Shukhrat Mukhamedjanov, SIC-ICWC made presentations to SDC and stakeholders on the Annual Progress Report for 2010 and on the Annual Action Plan for 2011. Kahramon Jumaboev and Bakhtiyar Matyakubov (IWMI) and Rustam Masumov (SIC-ICWC) reported on progress regarding the construction of water flow meters within some selected Water Users Associations in all the 3 countries of the project. The National coordinators of the project presented their Annual Action Plans for 2011.

In 2010, WPI-PL project reached more than 1,000 farmers and about 14,000 ha in the Fergana Valley. Despite its complexity involving several partners from farm level to National Research Institutes, the project had positive impacts in terms of irrigation and agronomic knowledge delivery to farmers, and in improving water productivity and crop yields in Fergana Valley.

More than 800 SANIIRI type water flow meters were constructed in the project area. Construction of water flow meters is expected to improve transparency and equity in water distribution within WUAs. In the future, farmers and WUAs will be trained on application of water meters for efficient use and distribution of irrigation water. Information Centers and Disseminators reported that several guidelines, brochures and monthly bulletins related to improved methods of irrigation, crop cultivation and agronomic aspects of farming were disseminated to farmers. National partners reported that WPI-PL project developed approaches and guidelines taken up in other ongoing projects in the region such as World Bank and SDC supported RESP-2 project in Uzbekistan and SEP HELVETAS project in Kyrgyzstan.

Kakhramon Jumaboev,
IWMI Central Asia office

Participants of the Annual stakeholder's workshop held in Tashkent on 11 March 2011
(Photo by Bakhtiyar Matyakubov)

Regional Workshop on "Information and Communication Technologies" for agricultural biodiversity

Regional Workshop on "Information and Communication Technologies (ICT)" was organized in the framework of Bioversity International/UNEP-GEF Project "In Situ/On Farm conservation and use of agricultural biodiversity (horticultural crops and wild fruit species) in Central Asia" on 28-30 March 2011 in Tashkent, Uzbekistan. Fourteen representatives of key project partners from Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan participated in the workshop. Mr. Massimo Buonaiuto, multimedia/web specialist, Paul Quek, scientist of documentation/information department, and Isabel Lapena, Regional consultant on access and benefit sharing were guest instructors at the workshop. Muhabbat Turdieva, Regional Project Coordinator, and Dilmurod Razikov, consultant on information and communication aspects also gave lectures in the workshop. Participants were provided with information on project web portal http://CentralAsia.bioversity.asia and web program Typo3. Typo3 is a Content Management System (CMS) with open source and free software license written in PHP. Mr. Massimo Buonaiuto gave a presentation on the Global Portal on Crop Wild Relatives (CWR), which is available at www.cropwildrelatives.org, developed using Typo3 as a result of the project "In situ conservation of crops wild relatives through enhanced information management and field application". Instructors also presented to participants the Darwin Core program, developed by Biodiversity Information Standards team, also known as the Taxonomic Databases Work Group (TDWG). The purpose of the Darwin Core program is to support information sharing on geographical distribution of organisms and physical existence

Participants of the regional training workshop on "Information Communication Technologies (ICT)"
(Photo by Gregoriy Ayzhenshtat)

of biotic species in collections. During the workshop participants had the opportunity to become familiar with project scientific databases (using CWR portal databases and Darwin Core), to agree on data to be compiled in central database, to discuss issues on Information Sharing Agreement by three types of information (open access information, information available for the project partners, information available to third parties upon permission), and to develop action plan.

Dr. Muhabbat Turdieva,
Bioversity International-Tashkent

Final workshop on "Adaptation to Climate Change in Central Asia and Peoples' Republic of China"

GIS and crop modelling groups are discussing achievements and remaining outputs
(Photo by Tulkun Yuldashev)

The final project workshop entitled "Adaptation to climate change in Central Asia and Peoples' Republic of China" was held on 1-3 March 2011 in Aleppo, Syria. The objective of the workshop was to build a common understanding in combining the outputs of different components of the project, including review of the achievements in farm surveys, climate change scenarios building, crop and economic modeling, as well as their current status and completion deadlines. The workshop was attended by 25 participants, including scientists from Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan and China along with ICARDA and IFPRI staff members.

The workshop was opened by Dr. Maarten van Ginkel, Deputy Director General of ICARDA with a welcome statement. In his speech he emphasized the importance of research on climate change in light of its impact on agriculture, as well as ICARDA's achievements in identifying strategies for climate change adaptation. Dr. Aden Aw–Hassan, Director of Social Economic and Policy research (SEPR), ICARDA, made an introductory presentation on the objectives and goals of the workshop.

Socio-economical group is presenting methods of investigation
(Photo by Ihtiyor Bobojonov)

In the socio-economic section of the workshop Dr. Ihtiyor Bobojonov delivered a presentation on "Farming Systems in Central Asia and Sample Selection" and Mr. Alisher Mirzabaev made a presentation on his PhD research in this area. National partners from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan made presentations on household survey results in their respective countries. The session on finalizing survey database from household surveys in Central Asia was followed by discussion of household survey challenges and recommendations for further improvements. In Geographic Information System (GIS) and Crop modeling section of the workshop, Dr. Eddy De Pauw presented high-resolution dataset for climate change impact assessment in Central Asia and north-west China. Drs. Rolf Sommer and Mariya Glazirina made presentations on crop modeling using CropSyst model by example of winter wheat. Drs. Edward Kato and Aziz Nurbekov presented their work on DSSAT crop model. Dr. Ephraim Nkonya made a presentation on "IFPRI's experiences with integration of climate change impacts on economic assessment and economic scenarios". Separate session of the workshop was devoted to presentations from Chinese participants.

Achievements of GIS, biophysical and socio-economic components of the project, remaining outputs and timelines were highlighted during the general discussion on integration of project components. Immediate actions such as output sharing, preparation of joint publications, dissemination of results, as well as prospective activities such as hydrology dynamics based analysis of the key rivers, introducing high-resolution Land Cover maps for Central Asia and other issues were identified and agreed by all participants.

Drs. Aziz Nurbekov, Mariya Glazirina and Tulkun Yuldashev
ICARDA-CAC

Training Course on "Establishing Potato Trials"

Participants of the training course
Tashkent, 17 March 2011

The International Potato Center (CIP) in collaboration with the Uzbek Scientific Research Institute of Vegetable-Melon Crops and Potato (UzSRIVMCP) organized a Training Course on "Establishing Potato Trials" in the premises of the Institute located in the outskirts of Tashkent, on 17 March 2011. It was organized for researchers of the same Institute, who conduct their activities at the research stations in Tashkent, Andijan, Samarkand, Syrdarya and Termez.

The training course was conducted by Dr. Firuz Yuldashev, CIP-Assistant in Plant Breeding and Selection, with the assistance of Dr. Rafiq Khakimov, Director of UzSRIVMCP, Durbek Khalikov, CIP-Assistant in Potato Agronomy, and Dilshod Tursunov -Technical Assistant from UzSRIVMCP.

The training course consisted of several training sessions with Power Point presentations on various topics such as field lay out, application of fertilizers, selection of planting materials, planting of pre-sprouted seed, management of the trial, data recording. It was followed by a field session where the participants helped in the planting of a field trial. At the end of the training course, each participant received a set of training materials, including the field-book and other hand-out materials.

Drs. Carlo Carli, Feruz Yuldashev
and Mr. Durbek Khalikov, CIP-Tashkent

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