

# CGIAR ECO-REGIONAL COLLABORATIVE RESEARCH PROGRAM FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN CENTRAL ASIA AND THE CAUCASUS

## ANNUAL REPORT<sup>1</sup> (2005-2006)

### INTRODUCTION

The CGIAR Consortium for sustainable agricultural development in Central Asia and the Caucasus, involving nine CG Centers (CIMMYT, CIP, ICARDA, ICRISAT, IFPRI, ILRI, IPGRI, IIRI, IWMI), and three other institutions (AVRDC, ICBA and MSU) is serving the eight National Agricultural Research Systems (NARS) of Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan since September 1998 through the Eco-Regional Collaborative Research Program for Sustainable Agricultural Development in Central Asia and the Caucasus. The goal of the Program is to achieve increased productivity through generation and transfer of sustainable production technologies, while ensuring protection of natural resources.

The CGIAR Program Facilitation Unit (PFU) provides support to the consortium partners for the conduct of their research activities. ICARDA is the lead center, whereas other centers are gradually expanding their collaborative research activities.

The program over the last eight years has made considerable progress in the following areas:

- 1) genetic resource conservation;
- 2) germplasm enhancement and crop diversification;
- 3) efficient soil and water management;
- 4) strengthening of NARS.

This report highlights, in brief, the various activities undertaken by the Consortium partners during the year 2005-2006.

### 1. GENETIC RESOURCE CONSERVATION

The CAC region is the center of origin of many economically important crop species. Here exists one of the world's best collections of fruits, nuts, and melons. Due to breaking of links with the VIR, the leading PGR institute in Russia, the support for genetic resources activities got weakened. Hence, efforts on PGR activities have been intensified. This Consortium, through active involvement of IPGRI, ICARDA, CIMMYT and other centers, is providing much needed support for PGR activities in the CAC region. A brief report is presented here on recent achievements.

#### Strengthening of Gene Banks

During the year under report, some exciting developments have taken place with regard to establishment of Gene Banks in almost all CAC countries. These are:

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<sup>1</sup> Presented by Dr. Raj Paroda, Head, CGIAR-PFU, at the Ninth CGIAR Program Steering Committee Meeting, held in Tashkent, Uzbekistan from 3-5 April, 2006.

### *Armenia*

The Ministry of Agriculture has decided to establish an Armenian National Gene Bank at the Agrobiotechnology Scientific Center. It is planned to rename this Center as Scientific Center of Agrobiotechnology and Genetic Resources. Also, the Ministry of Agriculture has provided funds for the renovation of the Gene Bank building. Mrs. Gayane Melyan, Manager, paid a visit to Uzbek and Georgian Gene Banks to get familiarized with various management aspects. Support has also been extended for the procurement of 2,000 aluminum foil packets, electronic balance, one PC, and a dehumidifier. It is expected to have this facility functional by mid-2006.

### *Azerbaijan*

Considering the importance of plant genetic resources, the Government of Azerbaijan made a strategic decision to rename its Institute of Genetics as Genetic Resources Institute (GRI). Subsequently, under the World Bank Competitive Grant Scheme (CGS), a proposal for renovation of the Gene Bank, based on technical input by PFU-ICARDA, was approved for funding of US\$ 50,000. The Gene Bank facilities have since been fully renovated and made functional. Recently, a standby generator, an electronic balance, a germinator and a dehumidifier have been provided under the Global Crop Diversity Trust project.

### *Georgia*

At the Georgian Research Institute of Crop Husbandry, a Gene Bank has been established after renovation of the building. All equipment for efficient functioning is currently in place. Also around 2000 accessions have been stored in the Medium Term storage. Under GCDT project, additional equipment has also been provided, including internet connectivity. Also, scientists concerned received training abroad. The Gene Bank Manager has recently returned back after training in USA under USDA support. Another scientist got training in Australia.

### *Kazakhstan*

The Government of Kazakhstan has taken a bold decision to establish a new Institute of Genetic Resources in Almaty to conserve valuable plant and animal genetic resources. IPGRI and ICARDA are providing technical backstopping with regard to design and plans for the new building, construction of which is likely to start during 2006.

### *Kyrgyzstan*

The Kyrgyz Plant Genetic Resources Center has been provided with 5,000 seed containers, an electronic balance, cooling system, an oven, and a dehumidifier, shelves for seed samples, necessary furniture and two computers.

### *Tajikistan*

The Plant Genetic Resources Center, inaugurated by Prof. Dr. Adel El-Beltagy in September, 2002 is now fully functional. Since then, the facility has been upgraded with 10,000 seed containers, electronic weighing scale, shelves, cooling system, a dehumidifier, a standby generator and an oven. So far, around 2400 accessions have been rejuvenated and stored in the Medium Term storage facility.

### *Turkmenistan*

During the ICARDA Regional Coordination Meeting in March, 2005, the Minister of Agriculture, Turkmenistan and Dr. Adel El-Beltagy opened the Turkmen National Gene Bank (TNGB). It is located in the newly constructed National Museum of White Wheat. ICARDA provided office furniture, laboratory equipment, including computer and printer, and seed containers to make the Gene Bank operational. Recently, under GCDT Project, a dehumidifier, two deep freezers, aluminum foil packets, an oven for moisture testing, etc. have been provided.

### *Uzbekistan*

Through the joint efforts of the Ministry of Agriculture and Water Management of Uzbekistan, USDA, ICARDA and IPGRI, Uzbek Gene Bank was renovated and made fully functional. ICARDA-PFU provided technical support for its renovation, designing, and purchasing different equipment. Beside PCs for documentation, 11,000 plastic containers, shelves in the storage room, a generator for cooling system, a dehumidifier have been provided. Under GCTD project, the Gene Bank has recently received additional equipment such as dehumidifier, moisture tester, additional 15,000 plastic bottles and support for internet connectivity, beside PCs.

### **Developing Regional PGR Strategy**

Efforts have been made to develop a regional PGR strategy by active involvement of the Working Group, which was established during the last Steering Committee meeting. The first draft of the strategy document was discussed with all the PGR National Coordinators during a meeting organized by ICARDA from 26-27 January, 2006 in Tashkent. The meeting also involved representatives from ICARDA and IPGRI. The revised draft strategy document has again been circulated to all concerned for their comments. It has also been decided to have National PGR strategies developed in each country by the national experts by June, 2006. The final draft of the Regional PGR Strategy is expected to be put up for endorsement in the next CATCN-PGR meeting to be organized by IPGRI by the end of 2006.

### **Other PGR Initiatives**

In collaboration with NARS, Vavilov Institute (VIR-Russia) and CLIMA, Australia, ICARDA organized a collection mission in Armenia from 6-19 July, 2005. In all, a total of 613 accessions of cereals, legumes, forage crops, as well as vegetables were collected and shared with host country. In total, more than 3000 accessions have been collected through 14 explorations in the CAC countries since the beginning of this program mainly under the ACIAR project.

A web-page on Plant Genetic Resources activities in Central Asia and the Caucasus is now functional. It highlights the relevant achievements in the field of PGR in the region. The address of web-page is: [www.cac-biodiversity.org](http://www.cac-biodiversity.org)

## **2. GERMPLASM ENHANCEMENT AND CROP DIVERSIFICATION**

Research activities on germplasm enhancement have focused on testing and identifying most promising breeding materials with resistance to both biotic and abiotic stresses. Under this collaborative program, twenty new promising varieties consisting of winter wheat (9), triticale (2) spring barley (1), chickpea (4), lentil (1), lathyrus (1) and groundnut (2) have recently been released in the region. These varieties have recorded consistently higher yield with superior quality and disease resistance over the local checks. Some of them are now covering large areas and getting popular with the farmers (Annexure I)

In addition, more than 64 promising entries of wheat (33), barley (10), triticale (4), chickpea (9), lentil (5) grass pea (2), and groundnut (1) are presently being tested by the State Variety Testing Commissions (SVTC), and are awaiting decision for their release and wide scale adoption.

### **Winter Wheat Improvement**

The collaborative program on wheat between Turkey-CIMMYT-ICARDA has provided much needed support for testing of improved germplasm. Under this program, nine varieties of winter

wheat: Azametly 95 and Nurlu 99 (Azerbaijan), Jamin, Zubkov, Azirbosh and Almira (Kyrgyzstan), Bitarap (Turkmenistan), Mtskheta-1 (Georgia) and Dostlik (Uzbekistan) have been released. Among these varieties, Almira has been released recently in Kyrgyzstan.

Variety Dostlik has performed exceedingly well in Uzbekistan, especially in drier and salt affected areas. About 7500 tons of seed was produced during 2005 and used for large-scale distribution to the farmers in Syrdarya, Djizzak, Samarkand, Bukhara and Khorezm Provinces. This year, Dostlik variety has covered more than 12,000 ha area.

About 1000 lines of cereals and legume crops are being tested annually by the breeders in Turkmenistan. Last year, a new variety Bitarap was officially released by the Government in view of its superior performance. In addition, one new variety each of bread wheat (Nissa) and durum wheat (Altyn Asr) have been submitted for testing to the SVTC in August 2004.

### **Other CIMMYT Initiatives**

In addition to joint Turkey-CIMMYT-ICARDA program activities, reported above, CIMMYT initiatives in the region cover a number of areas, concentrating mainly on improvement and introduction of spring wheat varieties, as well as conservation agriculture.

In the year under report, the 6<sup>th</sup> Kazakhstan-Siberia Network on Spring Wheat Improvement (KASIB) was formed both for bread and durum wheat varieties. Two KASIB meetings in east Kazakhstan and in Astana were held during that year. The shuttle breeding program established in 2000 has reached its full potential in 2005 with almost 1000 entries coming annually to Kazakhstan and Siberia. The adaptation of the germplasm is gradually improving. Some of the lines selected previously have now entered the breeding nurseries in national programs.

Considerable attention is being paid to pest and disease management. Over the last several years, the yellow rust incidence in the region has reduced, but the leaf rust incidence is becoming more and more important. Tan spot is also an emerging threat. Resistance to leaf spots, leaf rust and grain quality has to be emphasized more in the future research collaboration.

Practically most of the representatives of all research institutes and stations from Northern Kazakhstan attended the six month wheat improvement course in Mexico. Also, from 2005 a new regional journal "Agromeridian" has been started with major support of CIMMYT.

### **Barley Improvement**

Barley is grown mainly in Kazakhstan, as well as on small areas in Uzbekistan, Turkmenistan, Kyrgyzstan and Azerbaijan. Most of barley crop in Kazakhstan is spring type, grown as feed in the steppe, under rainfed conditions having annual precipitation of 250 -350 mm. In north Kazakhstan, a new spring barley variety called Golozerny has been selected in 2005 for advance testing.

In South Kazakhstan, Krasniy Vodopad Breeding Station is responsible for winter barley improvement. In 2005, a new variety Atameken has been submitted to SVTC. This is the second improved variety of winter barley submitted for official testing and release.

The Uzbek breeders have also selected a new barley variety named Tosun. The GallaAral Research Center has submitted this variety to the SVTC in January 2006 for final testing. It is the second variety selected from ICARDA materials after Pallidum-2002.

A promising variety of winter barley Adel is being tested by the SVTC in Kyrgyzstan and recently another variety Jenish-60 also has been submitted for final testing.

## **Legume Improvement**

### ***Food Legumes***

ICARDA scientists are working in close collaboration with the national legume breeders in the CAC region to identify promising chickpea and lentil varieties. Details of significant achievements are provided here:

#### **Chickpea**

Uzbekistan is the main chickpea producer in the region. Andijan Research Institute of Grain and Legume Crops has succeeded in selecting some new varieties. This year, a new variety Palvon was selected from FLIP 97-143C and submitted to SVTC.

Also at Galla-Aral station, another promising line FLIP 97-99 was selected under the rainfed conditions and submitted to SVTC under the name Djavlon. It has out yielded the local check Lazzat by 10-12% during the last three years and has resistance to diseases.

In Kyrgyzstan, new chickpea materials are being evaluated in Chu Valley. Two promising lines of chickpea Rafat from line FLIP 98-121C, and Saira from line FLIP 98-142C have been selected. Both are high yielding and resistant to diseases. In December 2005 Rafat has been officially released in Kyrgyzstan.

In Azerbaijan, new promising variety Narmin (FLIP 95-65) was released last year. It has out-yielded the check cultivar Vehovskaya by almost 20% over the last 3 years. Its seed is being multiplied for large-scale adoption.

In Georgia, breeders from Mtskheta station have selected another promising line ILC 3279 of chickpea, which has out yielded check by 18-23% over the last three years. This variety is being submitted to SVTC.

In Turkmenistan, promising chickpea selections are: FLIP 98-131, FLIP 82-150C, and FLIP 98-41C. These are also better in disease resistance, heat and drought tolerance, beside having high productivity. Based on last three years, promising line FLIP 98-131 was submitted to SVTC under the name Akhal for final testing and release.

#### **Lentil**

In Georgia, a new promising lentil entry ILL-1918 has been selected as high yielding with resistance to diseases. All available seed has been planted this year for further multiplication.

In Uzbekistan, Darmon is the second lentil variety submitted to SVTC. Earlier, variety Altyn Dan was submitted in 2003. This year, 360 kg of Altyn Dan and 40 kg of Darmon have been used for further seed multiplication. Darmon is high yielding (1.2 t/ha) and matures in 110 days. It can be harvested by combine since the first pod development takes place at about 25 cm above the ground.

In Turkmenistan, two promising lines of lentil LL-4400 and ILL-6037 have been selected as drought tolerant and disease resistant. In September 2005, ILL-6037 was submitted to SVTC under the name Rukhnama.

### ***Forage Crops***

Livestock is an integral part of the farming systems and the problem of forage and feed is quite acute in this region. This can be solved with the introduction of forage legumes in the existing crop rotations. The collaboration of ICARDA with NARS has resulted in identification of some promising materials.

In Kazakhstan, promising lines of forage legumes have been identified. These are: Sel 2757, Sel 2754, Sel 2746, Sel 2748 and Sel-2750 selected from *Vicia narbonensis* and *V. sativa* nursery. Currently, three promising lines of *Lathyrus* selected are: Sel 439, Sel 535 and Sel 536. *Lathyrus* variety Ali Bar (Sel 554) has officially been released in Kazakhstan based on its superior performance.

Breeders from Galla-Aral Station in Uzbekistan have selected vetch line *Vicia*-2628 and promising lines of *lathyrus*, IFVN-560 and IFVN-562. These lines are drought tolerant and high yielding. One line of *Vicia sativa* #2628 has been selected from ICARDA trials and submitted this year to SVTC under the name Vostok -85.

At Shorora Station, Tajikistan, forage breeders have selected two lines of *Vicia narbonensis* namely IFVN-561- Sel2469 and IFVN-556. Seed multiplication of these lines has been taken up currently.

Turkmen breeders have also identified three lines of Vetch. These are: IFVN 556 Sel 2376 and IFVN 563 Sel 2471 from IVAT-V-N and IFVS 2006 Sel2757 from IVAT-V-S nursery. Also, a new variety of *lathyrus* named Hassyly has been submitted to SVTC in Turkmenistan for final testing.

### **Seed Production**

Production of quality seed of high-yielding varieties is critical for faster varietal dissemination. Hence, special emphasis has been laid on the seed development activities in the region. On-farm trials and demonstration plots turned out to be the most important activity for increased agricultural production. The scientists and farmers are now keen to test new varieties. To have an impact on farmers' fields and for wide spread of promising varieties, efforts have been directed towards seed multiplication in collaboration with NARS partners. Details of the seeds of new varieties multiplied in the region are provided in this report in Annexure I.

### **Strengthening Rice Research**

In order to strengthen rice research activities, IRRI supported training of two young scientists (one from Kazakhstan and one from Uzbekistan) at Los Banos, Philippines for six months. One young scientist from Armenia was trained in rice production technology in Seoul, South Korea, and two senior officials participated in the 5<sup>th</sup> International Rice Genetics Symposium, in Manila. Two young scientists have been imparted intensive English training recently. Last year, 136 germplasm lines were made available for testing in the region. Out of 510 IRRI lines received by Uzbek Rice Research Institute in 2003, finally 16 promising lines were used for crossing program involving local varieties. Also, seeds of six rice varieties from South Korea (Hwaseongbyeo, Milyang-23, Jinbubyeo, Taebaekbyeo, Sangjubyeo and Odaebyeo) were

distributed among rice scientists of six CAC countries. These varieties were tested in 2004 and 2005.

A report on status of rice production constraints and opportunities is being finalized based on regional workshop-cum-trainings organized during 2003 and 2004. IRRI proposes to establish a Rice Research Network in the region, including Iran.

### **Groundnut Research**

During the year under report, two new varieties of groundnut: “Salomat” and “Mumtoz” were released in Uzbekistan. These were selected from breeding nurseries provided by ICRISAT. Both these varieties are high yielding and resistant to diseases. In 2005, ICRISAT also constituted trials of red-seeded advanced breeding lines specifically for four CAC countries. These were conducted in Armenia, Azerbaijan, Tajikistan and Turkmenistan. Results from the trials revealed good performance of new entries such as ICGV 93143, ICGV 95245 and ICGV 96066.

Under IFAR 2005 Professional Development Program, Dr Makhfurat Amanova, Head of Oil-bearing Crops Laboratory, Uzbek Research Institute of Plant Industry (UzRIPI), Uzbekistan received one-month training under supervision of Dr. S. Nigam at ICRISAT, on groundnut breeding and seed production methodologies. In order to initiate an active breeding program, four crosses: Kibray 4 x K 565211, Kibray 4 x K 565212, Mumtoz x K 565211 and ICGV 00417 x K 57426, were attempted by her at UzRIPI. Seed production of the two varieties “Salomat” and “Mumtoz”, released recently in Uzbekistan, was undertaken in Kibray and Surkhandarya regions. The seed so produced consists of 50 kg of super elite, 500 kg elite and 950 kg of first reproduction categories.

### **Potato Improvement**

The International Potato Center (CIP) activities, started in 2005, mainly concentrated on germplasm evaluation/selection, strengthening of formal and informal seed potato production systems, capacity building and infrastructure development. CIP started a threefold strategy for the supply of (i) elite potato clones, (ii) advanced true seed and (iii) TPS (True Potato Seed) families. Thirty four in-vitro elite potato clones combining resistance to viruses, early maturity, tolerance to abiotic stresses and high tuber quality were supplied by CIP to Armenia, Kazakhstan, Tajikistan and Uzbekistan, having tissue culture facilities. In Tajikistan, during the first generation, eighteen tuber families from eleven TS families were retained for further clonal selection and distribution to other CAC-NARS.

In addition, TPS families were evaluated for their adaptability to local conditions. Use of TPS is the best option for the marginal areas in the highlands because of difficult access to potato growing areas, unaffordable price of conventional tuber seed, and large number of smallholdings.

Activities were initiated in Georgia and Uzbekistan to strengthen informal and formal seed systems. In both countries, informal seed growers were trained in disease identification, and the implementation of seed plot technique and negative selection. In Uzbekistan, as part of research activities to strengthen the formal seed potato production system, selected seed lots (430) by the means of the seed plot technique were harvested in the highlands from a one hectare field. They will be tested for virus presence and those found disease-free will be rapidly multiplied in 2006 using a rapid potato seed multiplication technique recently adopted by CIP. Furthermore, in Uzbekistan, to determine the suitability for seed potato production in some localities in the

highlands, aphid monitoring was conducted with the help of a specialist of the Entomology Department of Tashkent State Agrarian University. Weekly aphid monitoring was conducted in the locality of Pschem during the main growing season (May till October) using two methods: the yellow water traps and aphid/leaf counts. By using the latter method, the threshold of 10 wingless aphids per 150 leaves was never reached as the highest number, corresponding to 6 adult aphids/week, was recorded on August 04.

CIP attaches considerable importance to human resource development as well as capacity building. A numbers of workshops, training courses and field days were organized; 20 NARS staff and 72 farmers were trained during missions in Uzbekistan, Georgia, Tajikistan, Azerbaijan and Kyrgyzstan. Also, a total of 17 specialists participated in two Regional Training Courses held in 2005. One training course was organized in India. CIP has also supported erection of two aphid-proof screenhouses in Georgia and Uzbekistan. In addition, equipment was provided to the Biotechnology Laboratory of the Tashkent State Agrarian University for collaborative research. Further to the assignment of a highland station by MoA to the Institute of Vegetables, Melon and Potato for research activities on potato and located at about 180 km from Tashkent, CIP rehabilitated the irrigation infrastructure so that a five hectare area can now be properly irrigated.

### **AVRDC Initiatives**

Soon after establishment of the Regional Office of AVRDC in Tashkent in January 2005 varietal trials of tomato, cucumber, vegetable soybean, Chinese leaf cabbage (pai-tsai), asparagus and mungbean were conducted in Uzbekistan and Azerbaijan. A number of promising lines have been selected and their seeds are being multiplied. Among these, three are non-traditional crops (vegetable soybean, Chinese leaf cabbage and asparagus). In 2005, four promising lines (2 of vegetable soybean and 2 of mungbean) were submitted to SVTC in Uzbekistan. For 2006, AVRDC has provided 21 varieties of tomato, pepper and vegetable soybean to Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan for AVRDC Pederal Varietal Trial. Also the Kazakh Research Institute of Potato and Vegetable Farming has been provided with 223 accessions of pepper and 59 accessions of tomato by the Gene Bank of World Vegetable Center. The Research Institute of Crop Husbandry of Armenia has been provided with 100 accessions of 5 vegetable crops (tomato-20, cucumber-20, eggplant-20, vigna-20 and soybean-20 accessions) and the Uzbek Research Institute of Plant Industry has been provided with 115 accessions of 9 vegetable crops (lettuce-25, cabbage-20, tomato-15, sweet pepper-20, eggplant-10, onion-10, cucumber-10, vegetable soybean-5) for further evaluation.

AVRDC also organized an International Workshop on “Improved Income and Nutrition in Central Asia and the Caucasus through Enhanced Market-and-Trade Oriented Vegetable Systems Research and Development” from 25-27 April, 2005 in Tashkent, attended by 74 participants from 16 countries. As an outcome, a CAC Regional Vegetable Crop Network got established and the National Coordinators were appointed from each country. In addition, six specialists from Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan participated in a workshop on “Conducting Trials of Promising Vegetable Varieties” held at AVRDC Headquarters, Taiwan from 25 September - 8 October, 2005.

### **ICBA Activities**

The International Center for Biosaline Agriculture (ICBA) started its activities in the CAC in 2003. Since then, it organized two trainings on biosaline agriculture for Central Asia in partnership with ICARDA Regional Office. In 2005, ICBA joined the Consortium as a new member and also initiated testing of salt tolerant germplasm material of different crops as a partner with IWMI and ICARDA in a ADB project on “Bright Spots”. The salt tolerant material,

being tested presently in the in the quarantine plots in Tashkent, will be distributed this year for testing in the project sites of Kazakhstan, Turkmenistan and Uzbekistan. In addition, locally available salt tolerant material is being tested in this project.

In December 2005, ICBA conducted a one-week training course in Tashkent on 'Germplasm evaluation, multiplication and data collection' to familiarize the national scientists with new salt tolerant crops.

In order to strengthen its presence in the CAC countries, ICBA has recently hired a plant scientist who will work from PFU-CAC Office.

### **Integrated Pest Management**

Integrated disease and pest management is an important part of germplasm improvement program. Scientists from ICARDA have studied the overall situation for controlling yellow rust – being the most important wheat disease in the region.

Identification of physiological races of yellow rust was undertaken in Azerbaijan, Kyrgyzstan and Uzbekistan. Data for mapping the distribution frequency of new races and the effective resistance genes to yellow rust have been undertaken. Recommendations for replacement of varieties susceptible to yellow rust have been made in view of release of new high yielding disease resistant winter wheat varieties in different countries under the existing research collaboration.

For the first time in the region, a Wheat-Cereal Leaf Beetle Nursery (WCLBK03) was established at Kyrgyz Research Institute of Agriculture and the Galla-Aral Branch of Andijan Research Institute of Grain, Uzbekistan, where 144 selected wheat lines were tested for their resistance.

IPM Sunn Pest Workshop on Increased Stability of Winter Wheat Production in Central Asia: A Systems Approach to Management of Sunn Pest was held from 13-19 March, 2005 in Almaty, Kazakhstan. 25 scientists from Kyrgyzstan and Kazakhstan attended the workshop. Also it is planned to organize a training on Yellow Rust Management in June, 2006 in Tashkent followed by an International Yellow Rust Conference in Issyk-Kul, Kyrgyzstan.

For IPM, a new project supported by USAID under IPM-CRSP has been initiated with partnership of Michigan State University (MSU), ICARDA and the University of California (Davis). It would mainly focus on biological control of Sunn Pest in wheat and other key pests of selected vegetable crops.

### **Crop Diversification**

The CAC region is known for monocropping of wheat and cotton. Traditionally, other crops are not grown, whereas crop diversification is key for increased cropping intensity, sustainability as well as increased income for the farmers. As such, under ADB project, ICARDA took major initiative to test and demonstrate the potential of crop diversification in the region. Some of the results are:

In spring wheat based cropping systems in northern Kazakhstan, our research efforts have revealed good opportunities for crop diversification. Field pea, chickpea, lentil and buckwheat are the best options for inclusion into existing rotations. Also, oat was found to be higher yielding than barley. During field days, farmers showed interest in grain legumes, but desired to

have better marketing options before large-scale adoption, as well as exposure to integrated crop production technologies.

In rainfed winter wheat based cropping systems, there are many opportunities to diversify crop production. Out of spring cereals, oat was found to be most productive and with highest water use efficiency in southeast Kazakhstan. Alfalfa is also very suitable for sustainable farming in semi-arid conditions of south Kazakhstan. Under rainfed conditions, the most successful crop appeared to be safflower, area under which has increased significantly (up to 100,000 ha). This crop is also becoming popular in both Uzbekistan and Kyrgyzstan.

In winter wheat based irrigated cropping systems, a number of alternatives have been identified for more economical and sustainable farming. Most beneficial are food legumes. Successful results were obtained in southeast Kazakhstan with soybean, in Kyrgyzstan with field pea, common bean and soybean. Safflower can also be grown under supplemental irrigation. In Kyrgyzstan and southeastern Kazakhstan, sugar beet and maize are also good alternatives for crop diversification. Nitrogen and phosphorus fertilizers at the rate of 60 kg/ha provided best returns in Kazakhstan. In southeastern Kazakhstan, most successful crop for diversification is soybean. Its area has increased recently from 3,000 ha in 2002 to around 40,000 ha in 2005. The major reason being: locally organized market in view of establishment of soybean processing plants.

In Fergana valley, Uzbekistan the most widespread crops after wheat are: maize (which provides feed and forage for animals), mungbean, melons and carrots. Rice is also used for double cropping using low salinity drainage water. In Termez area, southern Uzbekistan, maize and mungbean are widely accepted by the farmers for double cropping covering around 7,000 ha and 5,000, ha respectively. Other alternative crops used by the farmers are sesame, melons, groundnut and vegetables but rather on smaller scale. In Tajikistan, double cropping is widely adopted by small farmers. Maize and mungbean are widespread followed by common bean, soybean, vegetables, buckwheat, millet, tobacco, groundnut, and sesame. Rice is also grown where water availability is good.

Crop diversification studies were also initiated in the Caucasus. In Azerbaijan, encouraging results were obtained on soybean and sugar beet in irrigated areas, and chickpea under rainfed condition. In Georgia and Armenia, there is good potential for double cropping using common bean, forages and vegetables.

### **3. EFFICIENT SOIL AND WATER MANAGEMENT**

#### **ICARDA Activities on Conservation Agriculture**

The first phase of the ADB project “On-farm soil and water management for sustainable agricultural systems in Central Asia” was successfully completed and the second phase of the project started with effect from 1 January, 2004. The Second Steering Committee of the Project was held on 4 March, 2005 in Ashgabat, Turkmenistan, during which the workplan and budget for 2005 were approved. Some of the major findings during 2005 had been as under:

In rainfed spring wheat based system in northern Kazakhstan, zero tillage proved to be more profitable and energy saving during the last five years, provided nitrogen fertilizer was also applied. Direct seeding of spring wheat using modern no-tillage equipment has lately picked up on large areas. On the contrary, under rainfed winter wheat production system in southern Kazakhstan, conservation tillage did not show any noticeable effect on crop yield than the traditional practice of deep ploughing, though former was more economical. Technology of

direct sowing with a combine cultivator-drill was adopted in 2005 by ten farmers. In Kyrgyzstan, conservation tillage is more economical in rainfed agriculture and must be promoted for sustainable agriculture as adopted by six pilot farmers, but conservation tillage equipments should be made available in local markets. Under rainfed farming in Galla-Aral, Uzbekistan, direct seeding provided yield increase on summer fallow over the last three years due to better moisture accumulation. Adoption of this technology is being constrained by lack of equipment in the local market.

In irrigated cotton-wheat system in Tashkent and Termez provinces, Uzbekistan, broadcasting of wheat seeds under shallow cultivation compared to deep ploughing was found to be economical with no significant difference in grain yield. Wheat planting into standing cotton using minimum tillage has become a generally accepted practice in almost 40% of irrigated wheat areas in Tajikistan, Turkmenistan and Uzbekistan, thus enabling increased cropping intensity.

A newly designed equipment for planting winter wheat on cotton stubble and for seedbed preparation for soybean to raise double crop was tested during 2004-2005. Both the equipment were found to be good for conservation tillage as compared to local practice of deep ploughing. The study further indicated that nitrogen fertilization rates can be reduced by 20-25%. In Turkmenistan, during last two years, continuous shallow tillage with disks at 12 cm increased soil compaction resulting in lower crop yield. Therefore, in cotton-wheat rotation, reduced tillage was found appropriate for wheat sowing after cotton, whereas generally deep tillage proved useful for planting of cotton.

Raised bed planters, both local and those imported from Turkey, were tested in Azerbaijan, whereas in southern Kazakhstan and Uzbekistan they tested locally made ones and those imported from India. This practice helped in reducing the seed rate by almost half and provided higher wheat yields. At the same time, effective weed management appeared to be critical for the success of this technology. No-till planters imported from India were successfully tested in Uzbekistan for sowing wheat into standing cotton and for double cropping of mungbean and maize after the harvest of wheat.

### **FAO-TCP for Karakalpakstan**

ICARDA initiated a new FAO-TCP Project on “Sustainable agriculture practices in the drought-affected region of Karakalpakstan” in May, 2004. It has been implemented mainly on five pilot farms in Chimbay district, Karakalpakstan involving a team of national scientists in collaboration with ICARDA. During the year under report, project activities included: laser land leveling, crop diversification by planting summer crops and winter wheat, comparative study of winter wheat varieties on salinity tolerance as well as site survey and monitoring and establishment of WUA. ICARDA organized two workshops and two formal training courses for farmers and local scientists for introducing new conservation agriculture technologies.

Newly released winter wheat variety “Dostlik” was planted in the demonstration site. This variety showed good performance under conservation agriculture practices especially in salt and drought affected region of Karakalpakstan.

New implements such as three Brazilian planters, one sprayer and three Indian planters were imported and demonstrated for sowing of 9 different crops. Farmers showed keen interest and learned how to use these new equipment, which proved to be useful for crop diversification. Raised bed planter helped in getting higher yield of sunflower, maize, sorghum and mungbean.

## **CIMMYT Initiatives on Conservation Agriculture**

Under the supervision of Dr. Pat Wall, CIMMYT Dryland Agronomist, the work on zero tillage in northern Kazakhstan was initiated in 2000. About 3-4 research sites in northern Kazakhstan have been established, where the zero tillage technology has been introduced and the experiences of on-farm research in Karagandy, Karabalyk, Aktobe, Pavlodar and Ust-Kamenogorsk have been shared as well as documented. Since 2002, the Ministry of Agriculture of Kazakhstan has developed a Program to introduce conservation agriculture on an area of 1.5 million ha, and CIMMYT is providing the required technical backstopping.

Under a joint GTZ-CIMMYT project, raised bed planting technology for winter wheat and soybean has been tried, covering an area of about 400 ha in 2005. The results have revealed the saving of water by 30-40%, seed rate by 50%, more accumulation of snow and fast growth of plants. Five raised bed planters (3 for Kazakhstan, 1 for Kyrgyzstan and 1 for Uzbekistan) have been tested under varying agro-climatic conditions with very promising results.

### **On-Farm Water Management**

Results obtained in southern Kazakhstan showed that cutback irrigation increased yield of raw cotton by 17% and water use efficiency (WUE) by 37% as compared to control. In the Arys Turkistan, alternate furrow irrigation technology was disseminated in cotton on 113.7 ha area. In south-east Kazakhstan, raised bed planting technology, which saves 50% of seed and 15-30% of irrigation water, was tested on about 40 ha area on farmers' fields. Raised bed planting and cutback irrigation provided higher moisture uniformity, WUE and wheat yield, and lowered surface runoff than conventional planting and strip irrigation.

In Sokoluk district, Chu valley, Kyrgyzstan improved furrow irrigation technologies (cutback and alternate) were disseminated at nine farms on a total area of 333 ha. Various crops, such as winter wheat, sugar beet, water melons, sunflower, alfalfa, spring barley, maize, soybean, spring wheat, tomatoes and cabbage were tried. There was a direct positive relationship between the yield and WUE; as the yield increased WUE also increased.

Portable plastic chutes designed for sloping areas were introduced at five farmers' fields at Ulugbek farm, Uzbekistan. Plastic chutes, used in potato and onion, increased WUE by about 40% and increased yield by almost 10%. Under lowland conditions, portable chutes used in wheat and cotton at Kushman ota farm, Uzbekistan, provided better uniformity of water distribution, helped reducing water losses by about 30% and contributed to yield increase, on an average, by 12%. Micro-furrow (zigzag furrow) irrigation in cotton reduced surface runoff losses by 48% and soil erosion losses by 46% and increased WUE by 29% and yield by 12% as compared with conventional furrow irrigation.

The technology of drain water reuse was adopted on small farms (area of about 12 ha) located in Boykazon "shirkat" farm, Uzbekistan. A special device was installed to lift water from the drain to adjacent fields. Farmers used the system for irrigation of potato, onion, tomato, maize, alfalfa and poplar trees. The results showed that drain water as well as blended water (drain water + fresh water) can effectively be used for irrigation purposes.

Technology of alternate furrow irrigation using polyethylene film on 50 and 75% of soil surface increased WUE by 49 and 54%, respectively, as compared to alternate furrow irrigation with no mulching. Irrigation water applied, using alternate furrows covered by polyethylene film, was reduced by 39% as compared to alternate furrow irrigation. This technology was disseminated on 10 farmers' fields in Djizak Province, Uzbekistan, resulting in 14-24% increase in cotton yield.

Research activities carried out in Tajikistan revealed considerable potential of micro-furrow irrigation technology to combat soil erosion on sloping lands. On areas with slope gradients of 0.1 and 0.06, soil erosion got reduced by 86 and 84%, respectively. As compared with conventional furrow irrigation, use of micro-furrow irrigation also increased WUE and cotton yield by 29 and 21%, respectively.

Activities on kahriz system rehabilitation were continued at three sites, Khovdan, Gullidepe and Khuntush in Turkmenistan. Considerable progress was achieved at Khovdan site, where the water discharge was increased from 0.005 m<sup>3</sup>/s to 0.022 m<sup>3</sup>/s, which increased the irrigated area from 7 ha to 27 ha area.

Studies at Ter-Ter site, Azerbaijan revealed that in soybean, micro-sprinkler system reduced irrigation water requirement by 50% as compared to furrow irrigation. Combined with raised bed planting with application of fertilizer and microelements, micro-sprinkler irrigation also provided the highest yield of soybean.

### **IWMI Activities**

Most of the activities of IWMI during this year were focused on implementation of new projects. The third phase of Integrated Water Resource Management (IWRM) project in Fergana Valley (US \$ 2.4 million) was approved by SDC and the agreements were signed in April 2005. Implementation started from May, 2005, with its partner Scientific Information Centre of Interstate committee on Water Coordination (SIC of ICWC). Under the IWRM Phase III project, IWMI and SIC are trying to improve the achievements of the phase II and disseminate institutional reforms in accordance with locally accepted integrated water resources management principles. Water users are not only forming into Water Users Associations for better water distribution among themselves but also taking part in the governance of the main supply canal through their elected representatives. IWMI has also strengthened its Social Mobilisation and Institutional Development (SMID) activities under IWRM-Ferghana Project in each project country.

A new ADB funded project “Enabling communities in the Aral Sea Basin to combat land and water resource degradation through the creation of 'Bright' spots” was launched in January, 2005. The project is being implemented jointly by IWMI, ICARDA, and ICBA in close collaboration with NARS in Kazakhstan, Turkmenistan and Uzbekistan. A National Planning workshop was organized from 11-13 May, 2005 in Tashkent to finalize various activities for 2005 and started implementation of the same. Under the “Bright Spots” project, the researchers have identified 11 bright spots in Kazakhstan, 10 in Uzbekistan and 8 in Turkmenistan and a database has been created. NARS partners were also trained on social survey techniques.

IWMI also initiated several small projects using IWMI/EU funding: Water Productivity mapping of Syr Darya Basin using satellite sensor data; Livelihood assessment and water poverty mapping of Fergana valley; Food and Water Security Policy Assessment for future Uzbekistan using PODIUMSIM model; WTO policies; Cotton cultivation and water in Uzbekistan; Knowledge sharing project.

Relating to capacity building, IWMI held a series of training workshops in Jettisay, Makhtaaral district, South Kazakhstan to build capacities of local WUAs called Rural Water Users Cooperatives, based on the request of CounterPart International /USAID, in August, 2005. IWMI has prepared five training module for this purpose. Three MSc students from TIIM have been sponsored to obtain their degrees from Wageningen University of the Netherlands under the

TEMPUS project. Also, a student was supported for MSc at TIIM for the IFAR 2005 Fellowship Program.

### **Socio-Economic Studies**

The socio-economic research activities by ICARDA were focused on rural livelihood analysis and economic assessment of technologies found promising under the ADB Project. Livelihood analysis was conducted through structured farm-level surveys around project sites involving about 100 farming households per site in Kazakhstan (2 sites), Kyrgyzstan (2 sites) and Uzbekistan (1 site). Descriptive data analysis has been applied to address the following: (i) production properties of farming units based on irrigated agriculture, (ii) land and water management practices, including crop diversification issues, and (iii) farm property issues and access to credits. The survey results revealed that crop production systems in these countries are being re-established by merging small-scale farms into larger cooperative aggregates in order to ensure effective use of natural, financial and intellectual resources. Findings on land management and irrigation water practices indicated that farmers at the surveyed sites invariably used traditional methods of soil cultivation and irrigation; despite their awareness about the Project technologies to be over 70%. Analysis concerning property issues and land tenure revealed that the majority of on-farm activities were constrained because of inappropriate policies related to the activities of Water Users Association, irrigation water distribution and measuring, water pricing and farm taxation issues. Non-availability of inputs in time and lack of credit appeared to be the other important constraints.

In-depth assessment of rural livelihoods based on the survey data is underway and will be linked with the Project impact assessment to be undertaken during 2006.

### **4. STRENGTHENING OF NARS**

All centers involved laid considerable emphasis on capacity building. It includes various trainings, study tours, participation in international, regional and national scientific meetings and workshops, supply of computers and other research equipment, etc. During 2005, the CAC Program has arranged 14 short and long term training courses, study visits, traveling workshops and other training activities with participation of 390 scientists. In addition, regional and international conferences and field days were organized with participation of around 600 persons. Some important activities are given below, whereas details are provided in Annexure II.

#### **Conferences/ Workshops/Field Days**

Four scientists from CAC region participated in the CWANA Wheat Meeting organized at Aleppo, Syria from 8-10 May, 2005. Dr. Norman Borlaug, Nobel Peace Laureate, addressed the participants.

A regional traveling workshop on “Winter wheat improvement, seed production and cultivation technologies” was organized from 5-13 June, 2005 in Tajikistan, Uzbekistan and Kazakhstan. Around 35 scientists from all the five Central Asian countries as well as breeders, pathologists and agronomists from Iran, Turkey and USA, and experts from CIMMYT and ICARDA participated. The group traveled over 2000 km by the route Tashkent-Khodjent-Djizak-Samarkand-Shymkent-Taraz-Almaty and saw different wheat trials.

A Field Day on food legumes was held by Tajik Research Institute of Farming in June, 2005, involving around 130 participants. A similar field day attended by 20 farmers and scientists was organized at Krasny Vodopad breeding station in Kazakhstan. ICARDA specialists on food

legumes, Drs. Rajendra Malhotra and Ashutosh Sarker, visited Tajikistan, Uzbekistan and Kazakhstan from 15-25 June, 2005 to participate in these field days.

A Brainstorming Session on Agriculture Policy and Trade Related Issues in Central Asia was held in Tashkent, Uzbekistan, from 29-30 July, 2005 to discuss the issues related to sustainable growth of agricultural sector. It was jointly organized by IFPRI and CGIAR-PFU. In all, 24 participants attended, including representatives of the Ministry of Agriculture and Directors of Research Institutes of Agricultural Economics from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, representatives of donor organizations such as World Bank (WB), Asian Development Bank (ADB), Swiss Agency for Development and Cooperation (SDC), and Japan International Cooperation Agency (JICA).

A traveling workshop under the FAO-TCP Project on “Sustainable agricultural practices in the drought affected region of Karakapakistan” was organized to Khorezm, Bukhara and Tashkent Regions, from 13-16 August, 2005. In all, 18 farmers were exposed to conservation agriculture program.

The third national meeting on strengthening of wheat research program in Uzbekistan was held on 27 August, 2005. In total, 62 scientists from 15 different organizations and Research Institutes attended. Dr. A. Khanazarov, Dr. S. Rajaram, Dr. A. Amanov and Dr. Raj Paroda participated to discuss the progress. It was heartening to know that Uzbekistan has achieved record yield of 6 million tons and exported around 1 million tons of wheat last year.

A seminar on seed production of wheat and other cereal and legume crops was held under the FAO-TCP Project in Tashkent, Uzbekistan from 27-29 September, 2005. Around 20 representatives of the Ministry of Agriculture, Uzbek Scientific Production Center (USPCA), State Variety Testing Committee, Seed Quality Control Inspection, Quarantine Service, Agrarian University, and Station for Primary Seed Production, as well as the representatives of seed producers, and farmers attended.

Drs. L. Amirov from Azerbaijan, S. Imamov from Tajikistan, S. Kobakhia from Georgia and R. Medeubayev from Kazakhstan presented posters, whereas Dr. B. Djumakhanov made an oral presentation on Chickpea and Lentil: Future Protein Rich Crops for Central Asia and the Caucasus in the Fourth International Food Legume Conference held in New Delhi from 18-22 October, 2005.

An International Workshop on Carbon Sequestration in Central Asia was jointly organized by the Ohio State University, ICARDA, CIMMYT and the ARS-USDA from 1-4 November, 2005 in Columbus, Ohio, USA. In all, 61 participants representing scientists from CAC region and US universities, government institutions and international research centers, such as ICARDA, CIMMYT and IPGRI attended. The scientists from the CAC region presented ten papers: four from Kazakhstan, three from Uzbekistan, two from Russia and one from Tajikistan. Dr. Raj Paroda delivered the distinguished university lecture during the conference.

Prof. Abdushukur Khanazarov, Deputy Minister of Agriculture, Uzbekistan, and Dr. Zakir Khalikulov, PFU-CAC, visited IRRI and participated in the 5th International Rice Genetics Symposium, held in Manila, Philippines from 16-24 November, 2005. In all, around 700 scientists from different countries attended the Symposium.

Four scientists from Kazakhstan, Drs. A.Kurishbaev, Y.Zelensky, K.Abdullaev, A.Sagitov, alongwith Dr. Alex Morgounov and Dr. Bitore Djumahanov participated in the 7th International

Wheat Conference held at Mar del Plata, Argentina from 27 November - 2 December, 2005. Around 450 scientists from all over the world attended the conference.

A Technical Meeting on CAC Regional Inventory and PGR Information Network was held in Tashkent, Uzbekistan from 23-25 January 2006. In all, 27 scientists from CAC countries and ICARDA participated. During the meeting, it was agreed to complete all accession level inventories in electronic format by June, 2006.

A National Coordinators' Meeting on Regional Plant Genetic Resources (PGR) Strategy was organized in Tashkent, Uzbekistan from 26-27 January, 2006. The meeting also involved representatives from ICARDA and IPGRI.

A Workshop on Reorienting Research Management and Agricultural Innovation Systems in CAC was jointly organized by IFRPI, CACAARI and PFU-CGIAR from 10-11 February, 2006 in Tashkent, Uzbekistan. The objective of the workshop was to review the current status of research management in CAC. The workshop was followed by a Round Table discussion on ICARDA Strategic Plan for Dry Areas in CWANA region for 2005-2015.

The following events mainly ensuing farmers' participation took place under the ADB funded project on "Improving rural livelihoods through efficient on-farm water and soil fertility management in Central Asia":

- A workshop on "Raised bed planting technology" took place in Yangiyul, Tashkent Province on 8 June, 2005. The objective of the workshop was to share experience gained while testing and adjusting the newly imported raised bed planters, manufactured by Dashmesh Company in India.
- A traveling workshop on Crop Diversification and Zero Tillage in No-Fallow Dryland Agriculture was organized jointly by ICARDA, CIMMYT, SPC of Grain Farming (SPCGF), Shortandy, Kazakhstan and Siberian Research Institute of Agriculture (SRIA), Omsk, Russia in Northern Kazakhstan and Western Siberia from 25-30 July. The meeting in Shortandy was attended by 130 participants, and the ones in Omsk and North Kazakhstan station were attended by 50 participants.
- A Farmer's Field Day was organized by ICARDA-CAC Regional Program at Akbulak Farm in Pakhtakor District, Djizak province, Uzbekistan on 23 August, 2005. In total, 50 scientists and farmers from Uzbekistan participated in the event. The objective of the Field Day was to demonstrate the improved mulching technologies on ten farmers' fields around Djizak Branch of Cotton Growing Institute.
- A Workshop on "Progressive technologies of cultivation and irrigation of crops" was organized in Jambul Province, Kazakhstan on 27 September, 2005 in order to conduct on-farm demonstration of raised bed technology and improved furrow irrigation technologies. In all, 234 participants were present, including 11 heads and managers of departments and organizations, 221 managers of country facilities, farmers and workers from 16 rural area of Bajzak districts, 2 scientists from Kazakh Institute of Water Management and 2 specialists from IWMI and ICARDA.
- A Farmers' Field Day on Raised-bed planting for Higher Productivity and Water-Use Efficiency was organized at Ter-Ter by Azerbaijan Research Institute of Land Management (AzRILM), Azerbaijan Research Institute of Soil Erosion and Irrigation, Ter-Ter Experimental Station, and ICARDA-CAC on 26 October, 2005.

- A training course on Agricultural Extension and Transfer of Technology was held from 21-25 November, 2005 in Tashkent, Uzbekistan to provide decisions makers and scientists involved in agricultural research for development in the countries of Central Asia and Azerbaijan with the latest methodologies and approaches applied in extension services worldwide. A few farmers, actively involved in the research activities of the Project, also participated.

### **English Training**

An intensive English training course of 3 months was organized in Tashkent from 1 December, 2005. As in the previous years, it was organized jointly for the scientists involved in various Program activities representing different countries from Central Asia and the Caucasus. This time, 29 scientists participated. Since the beginning of this program, a total of 423 young scientists have been trained in English language.

### **Information Dissemination**

During the year under report a number of publications were brought out by PFU and Consortium partners both in English and Russian. These were widely disseminated to NARS collaborators. The details are:

- The CAC News was published quarterly in English and Russian for circulation among all the Consortium partners and other stakeholders. It covers various activities of the CGIAR Program in the region.
- The brochure entitled Ties that Bind: ICARDA in Central Asia and the Caucasus (A Decade of Achievement) was brought out in April, 2005 to mark the anniversary of cooperation with NARS of the region. Same was also translated into Russian and published for wide circulation.
- Proceedings of a Joint United Nations University (UNU)-Millennium Ecosystem Assessment (MA)-ICARDA International Workshop “Challenges for drylands in the new millennium - A cross-cutting approach for assessment”, organized earlier in Tashkent from 10-15 August, 2003, has recently been published. The proceedings have been edited by Drs. Zafar Adeel, David Clancy and Annette Dubreuil.
- ICARDA and CGIAR Flyers have been updated and published in 2005 in both Russian and English languages. Also, a number of posters and flyers for special events were brought out.
- The Groundnut Seed Production Manual of ICRISAT was translated into Russian and published in June, 2005. Same has been made available to all groundnut scientists in the region.
- An article entitled "Making water distribution more transparent: Application of the time-based water distribution method to tertiary canals in Central Asia", authored by a group of IWMI-Central Asia researchers, has been published in the recent issue of the Journal of Applied Irrigation Science (Vol.40/No. 2/2005).
- The Proceedings of International Workshop “Vegetable production in Central Asia. Status and Perspectives”, organized earlier in Almaty from 13-14 June, 2003, have been published jointly by AVRDC and CIMMYT. These have been edited by Drs. Thomas Kalb and Ravza Mavlyanova.

## **Website**

The web site of the CGIAR Collaborative Program for CAC is available for consortium partners on the Internet since September, 2001. It contains all relevant information on CG Centers and NARS partners involved in the Program as well as all major achievements made so far, both in English and Russian. The site can be accessed at: [www.icarda.org/cac](http://www.icarda.org/cac). It is also linked to the CGIAR website: [www.cgiar.org](http://www.cgiar.org).

## **MISCELLANEOUS ACTIVITIES**

### **Initiatives on Resource Generation**

A special donor support meeting for the CGIAR Program for CAC was organized in Marrakech on 5 December, 2005 during AGM'05. The meeting was well attended, including representatives of the World Bank, ADB, USAID, OPEC and other stakeholders. All participants highly commended the achievements of this project and assured their support to the CAC program.

A new ADB funded project “Enabling communities in the Aral Sea Basin to combat land and water resource degradation through the creation of 'Bright' spots” was launched in January, 2005. The project is being implemented jointly by IWMI, ICARDA, and ICBA in close collaboration with NARS in Kazakhstan, Turkmenistan and Uzbekistan. A National Planning workshop was organized from 11-13 May, 2005 in Tashkent to finalize various activities for 2005.

The third phase of Integrated Water Resource Management (IWRM) project in Fergana Valley (US \$ 2.4 million) has recently been approved by SDC during 2005, which is being implemented by IWMI.

A new FAO-TCP project in Uzbekistan Karakalpakstan region on “Enhanced productivity of cotton-wheat systems through adoption of conservation agriculture practices” was technically backstopped by ICARDA. The main goal of the project was to introduce conservation agriculture practices (zero/minimum tillage and raised bed-planting) for the cotton-wheat production system. The project activities were carried out at different demonstration sites on farmers' fields in Karakalpakstan, in partnership with the scientists from Tashkent Institute of Irrigation and Melioration (TIIM)

Another FAO-TCP project on “Improvement of Cereal, Leguminous, Oil and Forage Crops Seed Production” was got approved for Uzbekistan. ICARDA is an active partner in its implementation and providing required technical backstopping. A seed status report for Uzbekistan has been prepared beside organization of a national forum on seed development. In addition, a training program and the list of equipment for seed processing, to be procured by FAO, were attempted.

A new project on Integrated Pest Management has recently been funded by USAID under IPM-CRSP. The implementing lead institution is Michigan State University (MSU) in collaboration with ICARDA and UC-Davis. Recently, the Michigan State University has joined the Consortium as a new member. The project will cover activities on IPM in wheat and vegetable crops. Three scientists from the region have been recruited, who will work from the PFU office in Tashkent.

A new project on “In-situ/On Farm Conservation and Use of Agrobiodiversity (fruit crops and wild fruit species) in Central Asia” has recently been made operational for a five year period in

all the five Central Asian countries. This is being supported through UNEP-GEF for a total budget of around US\$ 11.5 million, of which GEF contribution will be US \$ 5.7 million.

IFAD has granted a new project with an outlay of US\$ 1.2 million for undertaking a Crop Livestock Research in Central Asia. It will look at the means of linking livestock farming and production systems with the market opportunities available. This project will be mainly exploring the various options for ensuring better income for the livestock farmers.

A new project on “Improving the Facilities of Genebanks in the CAC region” was funded by the Global Crop Diversity Trust in July 2005. Under this Project, support for the most urgent equipment needs of the genebanks has been provided.

In view of the assurance during the last Steering Committee meeting held in Aleppo, a fact finding mission in Kyrgyzstan, Tajikistan and Uzbekistan to assess the possibilities of strengthening PGR activities was organized by Sida. The details regarding future plans will be presented by Dr. Carl-Gustaf Thornstrom during this meeting.

### **Inter-Center Partnerships Strengthened**

The Inter-Center Partnership has been further strengthened by having new initiatives, such as varietal improvement of wheat (CIMMYT and ICARDA), crop diversification (ICARDA, ICRISAT, IRRI CIP and AVRDC), IPM (ICARDA, MSU and CIMMYT), soil and water management (ICARDA and IWMI), feed and livestock development (ICARDA and ILRI), plant genetic resources (IPGRI, ICARDA, CIMMYT, AVRDC and ICBA), and human resource development involving all centers, the details of which have been included in this report. PFU is also trying to facilitate the activities of other centers of the Consortium, who do not have their staff located in the region. Specific details of centerwise activities have already been provided in this report.

### **Awards and Recognitions**

The scientific support team of the CGIAR Program for CAC, consisting of Ms. Ilona Kononenko, Project Administrative Officer; Ms. Madina Musayeva, Research Fellow; Ms. Aziza Kalendarova, Office Secretary, PFU-CGIAR; Ms. Nadejda Loginova, Junior Office Secretary, ICARDA-CAC; and Ms. Nodira Adilova, Secretary to CACAARI (Central Asia and the Caucasus Association of Agricultural Research Institutions), received the best Team Award of CGIAR for the year 2005. The Award was given in recognition of their excellent support for important functions, such as: facilitation of inter-center partnership and eco-regional research activities in collaboration with NARS; improvement of donor relationship and development of new projects; and organization of conferences, training courses, workshops and seminars; active dissemination of knowledge; publication of quarterly CAC Newsletter/brochures/poster/publications. On behalf of the team, Ms. Ilona Kononenko received the award from Mr. Ian Johnson, Chairman, CGIAR on 7 December in Marrakech, Morocco, during the Annual General Meeting of CGIAR. This prestigious award carries a certificate and cash prize of US \$ 10,000.

Dr. Raj Paroda, Regional Coordinator, ICARDA-CAC and Head, PFU-CGIAR received the prestigious Norman Borlaug Award from Dr. A.P.J. Abdul Kalam, President of India. The award was presented during the 93rd session of the Indian Science Congress held in Hyderabad on 5 January, 2006, attended by around 5000 scientists.

Dr. Makhfurat Amanova, Head of Oil Crops Department, Uzbek Research Institute of Plant Industry (UzRIPI) had won the International Fund for Agricultural Research (IFAR) Fellowship of US\$ 10,000 under the 2005 Professional Development Program (IFAR Small Grants). She is conducting research on “Development/introduction of new groundnut varieties suitable for Uzbekistan and their seed multiplication” under the guidance of Dr. Shyam Nigam, Groundnut Breeder, ICRISAT.

Mr. Sayat Shortan, a young economist from Scientific Production Center of Grain Farming, Kazakhstan, won the prestigious IFAR/Wilfred Thalwitz Scholarship of US \$ 10,000 to pursue his research on the socio-economic aspects of crop diversification in Northern Kazakhstan under the guidance of Dr. Aden Aw-Hassan and Mekhlis Suleimenov of ICARDA. Studies conducted by him have revealed that there is a good potential for crop diversification in the northern part of Kazakhstan. Oil seeds and pulses proved to be the most profitable alternative crops in terms of net income per hectare. For example, return from lentil and sunflower was 3.5 times higher than that for wheat. However, market analysis regarding supply and demand for these alternative crops has to be further assessed and also sound policy support for promoting crop diversification is needed.

### **Important Visitors**

- Prof. Frank Rijsberman, Director General, IWMI visited Uzbekistan from 21-25 May, 2005 to oversee various IWMI activities in Central Asia. He addressed the staff of PFU-CGIAR and briefed about new IWMI vision and strategy in water resource management. He also informed about the approval by SDC of the third phase of Integrated Water Resource Management (IWRM) project in Fergana Valley, and was specifically pleased with an inter-center project on “Bright Spots” between IWMI-ICARDA-ICBA, funded by ADB.
- Dr. Rodomiro Ortiz, Director, Intensive Agro-ecosystem Program, CIMMYT visited Afghanistan, Tajikistan, Uzbekistan and Kazakhstan from 14-24 June, 2005. Intensive Agro-ecosystem Program of CIMMYT is one of the five programs leading the research and development in the areas with high inputs and water availability to improve the productivity, profitability and sustainability of the cropping systems, where wheat and maize play an important role.
- Dr. Ashok Gulati, Director Markets, Trade and Institutions Division (MTID), IFPRI visited Tashkent to participate in the Regional Brainstorming Session on Agricultural Policy and Trade Related Issues during the period from 29-30 July 2005. The Session was jointly organised by IFPRI and CGIAR CAC Program Facilitation Unit in order to discuss and bring out issues on agricultural policies and trade related challenges for developing appropriate research programs in the region.
- Dr. S. Rajaram, Program Director, Mega-Project on Integrated Gene Management, ICARDA, visited Kazakhstan and Uzbekistan from 27-31 August, 2005 in order to discuss future research and development plans for wheat improvement with NARS Heads and the wheat scientists. He announced the plan to strengthen wheat breeding work in the region and consequently sent 500 F<sub>2</sub> populations, which are planted currently at Research Institute of Plant Industry, Tashkent.
- Dr. Colin Piggin, Program Director, Mega-Project on Diversification and Sustainable Improvement of Rural Livelihoods in the Dry Areas, ICARDA, visited Kazakhstan and southern Siberia as participating in a traveling workshop on Crop Diversification and Zero Tillage in No-Fallow Dryland Agriculture organized jointly by ICARDA, CIMMYT, SPC of

Grain Farming (SPCGF), Shortandy, Kazakhstan and Siberian Research Institute of Agriculture (SRIA), Omsk, Russia. This was an important event to meet NARS leaders in the area of conservation tillage and crop diversification as well as cooperators from USA and Canada to further develop mutual relationship.

- Prof. Magdy Madkour, Assistant Director General (International Cooperation), ICARDA visited Uzbekistan and Kazakhstan from 21-23 September, 2005, to get acquainted with the activities undertaken under the Regional Program for Central Asia and the Caucasus (CAC) and to meet with national partners as well as staff of the Regional Office. This was Prof. Madkour’s first visit to the region. He also distributed the seeds of the first regional trial of promising wheat varieties that are performing well in Central Asia.
- Dr. Wilberforce Kisamba-Mugerwa, Director, ISNAR Division of IFPRI, accompanied by Dr. Suresh Babu, Senior Research Fellow, and Nienke Beintema, Head, Agricultural Science & Technology Indicators (ASTI), visited Tashkent from 10-13 February, 2006 to participate in the workshop on “Reorienting Research Management and Agricultural Innovation Systems in Central Asia and the Caucasus”, organized jointly by ISNAR-IFPRI, CACAARI and PFU-CGIAR for CAC.
- In addition, a number of scientists from different CG Centers visited the region for technical backstopping of their respective research programs as well as to participate in various meetings, workshops and training programs.



**The list of newly released varieties, their seed availability and approximate area covered**

<b>№</b>	<b>Crop/country</b>	<b>Name of variety</b>	<b>Available seeds (ton)</b>	<b>Released</b>	<b>Approximate area covered (ha)</b>
	<b>Wheat</b>				
1	Georgia	Mtskheta 1	7	Released/2002	30
2	Azerbaijan	Azametli 95	1000	Released/2004	25 000
3	Azerbaijan	Nurlu 99	400	Released/2004	30 000
4	Kyrgyzstan	Djamin	27	Released/2004	300
5	Kyrgyzstan	Zubkov	12	Released/2004	100
6	Kyrgyzstan	Azibrosh	20	Released/2004	300
7	Turkmenistan	Bitarap	6320	Released/2004	300
8	Uzbekistan	Dostlik	7.500	Released/2002	12 000
9	Kyrgyzstan	Almira	2	Released/2005	15
	<b>Barley</b>				
10	Armenia	Mamluk	1000	Released/2002	5000
	<b>Triticale</b>				
11	Kyrgyzstan	Alesha		Released/2005	
12	Kyrgyzstan	MISCIM		Released/2005	
	<b>Chickpea</b>				
13	Azerbaijan	Narmin	3.0	Released/2005	
14	Georgia	Elixsir	8.0	Released/2001	
15	Kazakhstan	ICARDA-1	2.5	Released/2005	
16	Kyrgyzstan	Rafat	0.3	Released/2005	
	<b>Lentil</b>				
17	Georgia	Pablo	2.6	Released/2001	
	<b>Grass pea</b>				
18	Kazakhstan	Ali Bar	1.8	Released/2005	
	<b>Groundnut</b>				
19	Uzbekistan	Mumtaz		Released/2005	
20	Uzbekistan	Salomat		Released/2005	

**Human Resource Development Activities (May, 2005-March, 2006)****A. Genetic Resource Conservation**

<i>Date and venue</i>	<i>Organization</i>	<i>Event</i>	<i>Participants</i>
26-30 May, 2005, Tashkent	ICARDA	A practical hands-on PGR data management Training course	13 scientists from Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan
17-24 September, 2005, Tashkent	ICARDA-CAC/UzRIPI	Orientation towards Genebank management and learning about last version of ICARDA-CAC database for PGR	1 scientist from Armenia
23-25 January, 2006, Tashkent	PFU-CGIAR/ICARDA	Technical Meeting on CAC Regional Inventory and PGR Information Network	27 participants from CAC countries
26-27 January, 2006, Tashkent	PFU-CGIAR/ICARDA	Meeting on Development of Regional PGR Strategy	37 participants from CAC countries, including Regional PGR Coordinators

**B. Germplasm Enhancement**

<i>Date and venue</i>	<i>Organization</i>	<i>Event</i>	<i>Participants</i>
28 August – 11 September, 2005, Seoul, South Korea	IRRI	Course on Transfer of Rice Technologies	1 participant from Armenia
19-23 September, 2005, Tashkent	CIP	The first training course on Potato Seed Production	9 participants from CAC
25 September – 8 October, 2005, Taiwan	AVRDC	Training workshop on “Conducting Trials of Promising Vegetable Varieties”	6 specialists from CAC region
26 September – 7 October, 2005, Turkey	CIMMYT/ICARDA	International training course on “Conservation Agriculture Technologies for Rainfed Wheat Production Systems”	10 participants from Central Asia and the Caucasus
29 September - 4 October, 2005, Tashkent	ICARDA-CAC/FAO	A training course on “Integrated Quality Management in Seed Production”	18 participants from Uzbekistan
September, 2005 – February, 2006 Los Banos, Philippines	IRRI	6 month training on rice breeding and production	1 scientist from Uzbekistan and one scientist from Kazakhstan
28-30 November, 2005, Modipuram, India	CIP	Training course on True Potato Seed (TPS) Technology	8 participants from CAC

### **C. Soil and Water Management**

<i>Date and venue</i>	<i>Organization</i>	<i>Event</i>	<i>Participants</i>
13-16 June, 2005 Taraz, Kazakhstan	IWMI	Training course on “Participatory Rural Appraisal (PRA) Tools, Effective Communication Skills and Interviewing”	20 participants from Kazakhstan
25-30 July, 2005, Northern Kazakhstan and Western Siberia	ICARDA- CAC/ CIMMYT	Traveling workshop on Zero Tillage, Crop Diversification in No-fallow Crop Rotations in Northern Kazakhstan and Western Siberia	10 scientists from CA and three Kazakh farmers
27 September, 2005, Jambul Province, Kazakhstan	ICARDA- CAC	A workshop on “Progressive Cultivation and Irrigation Technologies”	234 participants from Kazakhstan
21-25 November, 2005, Tashkent	ICARDA- CAC	Training course on “Agricultural Extension and Transfer of Technology”	23 participants from Central Asia and Azerbaijan
12-16 December, 2005, Tashkent	ICBA/ ICARDA/ IWMI	Training course on “Germplasm Evaluation, Multiplication and Data Collection”	16 participants from CA

### **D. English Language Training**

<i>Date and venue</i>	<i>Organization</i>	<i>Event</i>	<i>Participants</i>
1 December, 2005 – 1 March, 2006, Tashkent	CGIAR-PFU and all Centers	English training course	29 participants from all eight countries