PROGRESS REPORT

CONSERVATION AGRICULTURE FOR IRRIGATED AREAS IN AZERBAIJAN, KAZAKHSTAN, TURKMENISTAN AND UZBEKISTAN

November – 22, 2012

Tashkent, Uzbekistan

Submitted by

ICARDA

PROGRESS REPORT COVER PAGE

Project Title:	**CONSERVATION AGRICULTURE FOR IRRIGATED AREAS IN AZERBAIJAN, KAZAKHSTAN, TURKMENISTAN AND UZBEKISTAN**
Project Number:	**GCP/RER/030/TUR**
Starting date:	**January 2011**
Completion date:	**September 2013**
Reporting period:	**June – December 2012**
Countries:	**Azerbaijan, Kazakhstan and Uzbekistan**
Name:	**ICARDA**
Address:	**P.O. Box 4564, Tashkent** **700000, Uzbekistan**
Tel. number:	**+998-71-1372130/1372169**
Fax number:	**+998-71-1207125**
E-mail:	**a.nurbekov@cgiar.org**
Contact person:	**Dr. Aziz Nurbekov** Project regional coordinator

Date of Report: Author of Report: Dr. Aziz Nurbekov

Reporting Period: September – November Approved by:

A. PROGRESS AND OUTPUTS

Output 1.1 Improved crop production and management within demonstration sites through accelerated adoption of conservation agricultural practices

- Conservation agriculture practices were tested at three demonstration sites covering all three respective project countries. Minimum tillage by disking, minimum tillage by chiseling and no-till technologies were tested along with conventional practices in the irrigated conditions.
- No-till maize, in Azerbaijan and Kazakhstan, under irrigated agriculture provided yields comparable to those obtained through full tillage and minimum tillages.
- Winter wheat yield was higher in the treatment with no till method compared to the other treatments in Azerbaijan and Uzbekistan.
- Mung bean was seeded into wheat stubble in Uzbekistan by no-till planter and grain yield was slightly higher than tilled mung bean.
- Direct seeding of double cropped crops supervised across the project countries and obtained data is statistically analyzing.

Output 1.2 Raised-bed planter and land levelling technology adjusted and applied, and more efficient water utilization for the crop rotations introduced, as compared with traditional cropping systems

- Selected farms were surveyed and carried out soil analysis
- Bed planting method tested in Azerbaijan, Kazakhstan as well as in Uzbekistan reduced seed rates by almost half and provided higher winter wheat yields.
- The highest winter wheat grain yield, with bed planting, was recorded (5.10 t/ha) in farmer 1, while lowest grain yield was recorded (2.23 t/ha) in farmer 2 with traditional planting in Azerbaijan.
- Wheat was planted in Sayram site Kazakhstan, using the bedplanter at seeding rates 100, 120, 140 kg/ha, while in the broadcasting method the seeding rate was 200 kg/ha. The best sowing rate with regard to grain yield across planting methods was bed planting at 120 kg/ha and had the highest (4.54 t/ha) grain yield compare to control treatment.
- Water use efficiency was significantly higher with the bed planting (2.36 and 2.11 kg/ m-3) compared to conventional planting (1.67 and 1.85 kg/ m-3).
- Laser land leveling was made on 4 ha in Azerbaijan which is the base for improved irrigation practices. Less and more efficient water use for the new crop rotations introduced
- The best improved irrigation technology and crop rotations will be identified and will be recommended for adoption in the project countries and will be introduced to the farms of the country.

Output 1.3 Crop rotations diversified with crops suitable for CA

- On-farm training on water and crop management were carried out in the project countries
- Crop diversification practices were tested at three demonstrations sites in Azerbaijan, Kazakhstan and Uzbekistan. Field trials in Azerbaijan included testing of food legumes (soybean and kidney bean), small grains (winter wheat, winter barley, buckwheat, pearl millet and millet).
- In Kazakhstan maize, mungbean, soybean and kidney bean were studied as compared to summer fallow after winter wheat harvest.
- Mungbean was studied under irrigated wheat – cotton rotation in Uzbekistan for double cropping after the harvest of winter wheat. It was found that food legumes are the best crops for diversification under conservation agriculture in the irrigated conditions. It is a good starting point for Conservation Agriculture in cotton-wheat cropping system.

- All the above mentioned crops were planted by using Brazilian no-till drill (Please see pictures at annex 1).

Output 1.4 Confidence of farmers, extension services and other stakeholders on principles of CA increased

- Growing conditions of crops on selected farms (demonstration and control plots) monitoring. All work on testing new technologies has been done in a farmers' participatory method during field days which helped to disseminate technologies on wider area.
- The highest net benefits (745 USD ha-1) were obtained with bed planting while the conventional method achieved the lowest net benefits (495 USD ha-1) in Azerbaijan. The profitability was 139% for bed planting.
- Socioeconomic survey instrument has been pre-tested and fine-tuned. The sampling methodology has been developed and sample sizes were determined.
- Farmer perceptions and preferences are being monitoring. The economic impact of the traditional and bed planting technologies are being analyzing.

Output 1.5 Farmer-oriented brochures and guidelines on applying CA practices in irrigated and rainfed areas in the selected countries produced and printed.

- A draft guideline on improved land, water and crop management through CA technology is preparing
- A brochure on conservation agriculture practices in Kazakhstan was published in Russian language.
- A leaflet on specifications of zero till planter was published in Uzbekistan
- A poster on conservation agriculture in Azerbaijan was published in Azerbaijan
- A poster entitled "Conservation agriculture for irrigated areas in Azerbaijan, Kazakhstan, and Uzbekistan" was prepared and presented in European Regional Conference (ERC) 2012: "Save and Grow" and promotion of Conservation Agriculture Baku, Azerbaijan
- Also scientists have produced and published 5 scientific papers based on the results achieved under the project.
- National TV covered the Field Days and interviewed Drs Asad Musaev, Zokhidjon Ziyadullaev and Dossymbek Sydyk in Azerbaijan, Kazakhstan and Uzbekistan respectively.

Output 1.6 Capacity building activities in the area of CA designed and carried out at the benefit of farm households and national partners.

- To strengthen the capacities of farmers, three Field days, involving about 190 farmers and representatives of local authorities were organized. During these field days, improved technologies of irrigation, conservation agriculture and crop diversification have been demonstrated by the scientists and collaborating farmers. The capability of the no-till seeder to seed maize (Azerbaijan and Kazakhstan) and mungbean (Uzbekistan) directly behind the combining of wheat was demonstrated during the field days which were conducted in 2012. Dr. Theodor Friedrich, Senior Expert from FAO, participated field training course in Azerbaijan, Kazakhstan and Uzbekistan, and made a presentation and also Dr. David Feindel, ICARDA Senior Specialist, in the field of Agronomy participated and interacted with the participants during in the field days in Azerbaijan and Uzbekistan. The participants clearly recognized the need for introducing conservation agriculture practices in the country (please see annex 2).
- A series of training courses on Conservation Agriculture practices were conducted in Azerbaijan, Kazakhstan and Uzbekistan. In all, 221 participants attended the course, including policy makers, delegates from Ministry of Agriculture, researchers, national consultants of the project, and

farmers. The main objectives of the courses were to train the scientists and farmers on the required skills and tools to be used in better targeting of conservation agricultural research in order to increase adoption of conservation agriculture technologies in the respective countries (Please see annex 3).

FAO evaluation mission

A visit of FAO experts (Drs. T. Friedrich and Hafiz Muminjanov to Azerbaijan, Kazakhstan and Uzbekistan in June 2012) was facilitated by ICARDA-CAC in close consultation with FAO/SEC and AGP. ICARDA scientist Dr. A. Nurbekov accompanied the FAO experts mission to the project demonstration site in Terter (Azerbaijan), Sayram (Kazakhstan) and Kasbi (Uzbekistan).

B. INPUTS

Dr. Aziz Nurbekov, Project Regional Coordinator, continued to communicate with FAO, Ministries of Agriculture of the Republics of Azerbaijan, Kazakhstan and Uzbekistan, and the National Project Coordinators and Managers and undertake technical monitoring for the day-to-day activities of the project. He was involved in all decisions on Project activities.

I. Equipment received during the reporting period

The project provided three boom sprayers for project countries. The boom sprayers are already installed and are working in the project demo sites in each country. The new technology was appreciated first of all by farmers who were keen to use no-till technology for planting winter wheat in the fall and sunflower, maize, mungbean, pearl millet, kidney bean as second crop in the summer. Moreover the CA technology was appreciated by the Governor of the District who facilitated planting of winter wheat on area. Government officials on provincial level visited the demonstration sites in each country and expressed interest in no-tillage technology. The no-till drill was used for planting winter crops in the fall of 2011 91 ha including about 73 ha without any soil tillage in Azerbaijan, Kazakhstan and Uzbekistan. And the planters also were used to plant spring and summer crops on area 450 ha in Azerbaijan, Kazakhstan and Uzbekistan.

II. Training activities during the reporting period

The Project document required the organizing of training of private farmers involved in the project together with extension staff on integrated crop management, improved irrigation and water conservation practices with key topics related to the introduction of new range of crops, weed control (use of chemicals), crop residues/cover crops, crop rotations, direct drilling, irrigation frequency, harvest, and crop storage. Field training courses were organized. Farmers from the project pilot site, and adjoining areas participated and became acquainted with conservation agriculture practices. The field training courses (221) and field days (190) were organized in Azerbaijan, Kazakhstan and Uzbekistan and were attended by policy makers, researchers, agronomists and farmers.

C. PROBLEMS ENCOUNTERED AND ACTIONS TAKEN OR REQUESTED TO RESOLVE THEM

- Operation of newly introduced no-till seed drills requires the knowledge of the variety of the openers and coulters and their effects on the groove shape and seed placement. Groove shape and

seed placement play important roles in seed germination in the under moist soil moisture conditions for seed germination.

- Traditionally, the herbicide application in Central Asia is done largely with air blast sprayers. There is limited knowledge of other types of available sprayers such as rotary plate, boom, ultra low volume that produce different sizes of droplets. In CA, boom sprayers are widely used, which are fitted with different types of nozzles to target leaves. Exploitation of boom sprayers requires good understanding of nozzle types, angles produced by nozzles to insure good coverage, pressure, preparation of solutions to name few.
- Quality of staff for data collection and entry with some partners - constant follow-up needed to show that we were seriously interested in real research data to be published in PR journals.
- Time demanding nature of repeated supervision and training of 3 geographically spread sites – led to more cluster-wise trainings and reduced monitoring visits but active continuous telephonic follow-up.

D. WORK PLAN AND EXPECTED OUTPUTS FOR THE NEXT REPORTING PERIOD

I.WORK PLAN

For more details please see annex 4.

II. EXPECTED OUTPUTS FOR THE NEXT REPORTING PERIOD

II.i. Improved crop production and management within demonstration sites through accelerated adoption of conservation agricultural practices.

Best tillage option will be assessed and will be recommended to be adopted in Karabakh low lands and introduced to the farms of the country. Economic impact of the conventional and no-till will be assessed. Economic impact of the traditional and conservation agriculture technologies will be assessed. Collaboration with other projects on conservation agriculture will take place to exchange experiences and equipment.

II.ii. Raised-bed planter and land levelling technology adjusted and applied, and more efficient water utilization for the crop rotations introduced, as compared with traditional cropping systems.

The best improved irrigation technology and crop rotations will be identified and will be recommended for adoption in the project countries and introduced to the farms of the country. The best irrigate rate and improved water management technology will be identified and will be recommended. The water management technology can be introduced to the farms of the country. Farmer perceptions and preferences will be monitored. The economic impact of the traditional and bed planting technologies will be assessed.

II.ii. Crop rotations diversified with crops suitable for CA

Best and well adapted short term crop rotation with conservation agriculture practices will be recommended to the farms of the respective project countries.

II.iv. Confidence of farmers, extension services and other stakeholders on principles of CA increased

Monitor growing conditions of crops on selected farms (demonstration and control plots) will be conducted. Economic analysis of production costs of introduced CA technology will be carried out.

II.v. Farmer-oriented brochures and guidelines on applying CA practices in irrigated and rainfed areas in the selected countries produced and printed.

A poster on short-term crop rotation will be produced and also a research paper will be published in local Journal. Booklets and posters on the project results will be produced and will be distributed during field days and training courses. A research paper will be prepared for International Peer Reviewed Journal in 2013.

II.vi. Capacity building activities in the area of CA designed and carried out at the benefit of farm households and national partners.

A field day on crop rotation in the project demonstration site will be organized for farmers and policy makers during the cropping cycle to promote information exchange to encourage adoption in the region. The farmers will be trained in improved agronomic practices of corn production. For all activities, field days and training courses will be organized for farmers and policy makers during the cropping cycle to promote information exchange to encourage adoption.

Some issues deserve special attention in 2012 and 2013:

- Finalization of data collection and data entry, in particular data necessary for economic evaluation of interventions
- Strengthening activities on conservation agriculture with main emphasis on crop rotation
- Organization of field days, field and formal trainings with a range of stakeholders
- Producing training material for successful interventions
- Training of students working in the project
- Data analysis and report writing
- Prepare scientific articles for PR Journals
- End of project workshop

E. REPORTS

Dr. A. Nurbekov is reporting timely on all project activities and communicated routinely with FAO (Drs. T. Friedrich, and Hafiz Muminjanov) on implementation of Project activities including financial issues. MoA of Azerbaijan, Kazakhstan and Uzbekistan were represented by Drs. Asad Musaev, Dossymbek Siddiq and Zokhidjon Ziyadullaev respectively with whom communications have taken place on a daily basis.

ANNEX 1

PICTURES

No-till sunflower after winter wheat in Azerbaijan, 28 Aug. 2012

No-till maize after winter barley in Azerbaijan, 03 Oct. 2012

Bed planted kidneybean in Kazakhstan, 12 Jul. 2012

No-till maize after alfalfa in Kazakhstan, 16 Aug. 2012

No-till mungbean after winter wheat in Uzbekistan, 27 Jul. 2012

Bed planted soy bean in Uzbekistan, 01 Jul. 2012

ANNEX 2

FIELD DAYS

Field days in Azerbaijan

A field day was organized on June 4, 2012 in Ter-Ter, Azerbaijan. Total number of participants was 70. The field day provided the opportunity to not only hear international and local speakers on the use of conservation agriculture overseas and locally but also provided a healthy forum for the sharing of information on some of key issues of conservation agriculture, no-till wheat field performance, residue management and improving soil health, reducing erosion. Another feature of this field was to reinstall and discuss features of a modified, multi-crop planting zero till drill imported from Brazil in our no-till farming systems in the project demonstration site.

Dr. Asad Musaev National Project Manager and Head Azerbaijan Agrarian Center said the Government of Azerbaijan is willing to support farmers to adopt conservation agriculture farming practices which can be an excellent job promoting practical methods for improving soil health and reducing erosion. Dr. Theodor Friedrich, FAO, made an introductory presentation about zero till drill its features, specifications and how to convert to plant either field or row crops. He also informed participants that during the field day you will be able to get an understanding of how this planter work on different soil conditions, on different crops at different speeds. After planting of summer crops the planter again will be put together in the next few months and will be ready to plant winter crops in the project demo site. Dr. Hafiz Miminjanov also made a presentation about conservation agriculture in the Central Asia. He said that FAO/SEC is delighted to support conservation agriculture project with ICARDA. "FAO/SEC is aware farmers across a wide area have a strong interest in no-till developments and we do hope that farmers can benefit from the opportunity to test this new planting unit on their properties. Dr. Aziz Nurbekov a delivered his talk on conservation agriculture in the project demo site & use of zero till drill in row crops. He also answered to the queries made by the farmers about zero till drill. On the request of farmers Dr. Asad Musaev assured them help for availability of zero till planter. It was really nice to know that farmers are now taking keen interest in zero till drill seeded summer crops after winter wheat harvest.

During the field day the capability of the zero till seeder to seed maize directly behind the combining of winter barley was demonstrated and also a group visited a number of project demonstration fields and discussed crucial issues of adoption of conservation agriculture in the country. The field day was successful in the sense that ZT drill of the project were successfully introduced and examined by the participants.

Field day in Kazakhstan

A field day was organized 12 June, 2012 in Sayram district of Southern Kazakhstan province under the FAO-GCP Project on conservation agriculture by the ICARDA Regional Office in Tashkent in cooperation with Research Institute of Livestock and Crop Production. In this field day, more than 50 farmers, specialists and scientists participated including representatives from FAO, ICARDA, Agricultural Department of Kazakhstan Province, Sayram District Farmers Association, Research Institutions and Universities. Mr. Polatboy Tastanov, Deputy Head Agricultural Department of Southern Kazakhstan Province, chaired the opening session. Opening statement was made by Prof. Dossymbek Syddyk, Project National Manager. He said that

the FAO GCP “Conservation Agriculture in the Irrigated Areas of Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan” project has started a year ago in Kazakhstan and project activities successfully implementing by the project team in Kazakhstan. Recently a zero till drill was brought from Brazil and Dr. Theodor from FAO will tell you about specifications of the planter. Mr. Polatboy Tastanov, made a Welcome Address presentation in the field day. Dr. Theodor Friedrich, FAO, dwelled on new zero till drill and use of the machine in the project demo site in Sayram district. He has showed how to adjust seed and fertilizer rate, seed depth of the no-till drill. He said he was keen to talk about zero till machine and demonstrate planting of maize into standing alfalfa field which was done for the time in Kazakhstan. The participants were keen to see new planter which will be improve production and reduces production costs.

Dr. Aziz Nurbekov briefly informed the participants about bed planting practices in the project demonstration pilot site. He said bed planting holds immense potential for improving irrigated wheat-based cropping systems by making them resource saving and more sustainable. Our last year’s results showed that yields may be improved by at least 10% with the proper variety, production costs can fall by 20-30%, and irrigation water requirements can be reduced up to 35% compared to conventional planting on the flat beds.

Dr. Theodor was requested to make a presentation “Status, Challenges and Perspectives of Conservation Agriculture in Central Asian Countries” and he made the presentation after the field visit. He informed the meeting about perspectives of conservation agriculture at the global level, spreading, drivers for adoption, and FAO official definition for conservation agriculture. He dwelled on global adoption and history of conservation agriculture in the world. He concluded that conservation Agriculture continues spreading around the world; originally a farmer’s driven process only, attention is increasing by governments and development organizations; CA is getting recognized as tool to Save and Grow; some regions still struggle with introduction (Europe, South Asia); other regions struggle with keeping good quality CA (Latin America with Soya) and further policy support is needed for faster adoption AND for safeguarding quality of CA to ensure environmental services. The presentation very well received by the participants.

The farmers were very happy to interact with the FAO and ICARDA experts during the field day. FAO and ICARDA experts, Project National Consultants, specialists and farmers are exchanged with own experiences in the field of conservation agriculture practices, diversification of proposed crops in the project demonstration site, new farm machinery for zero tillage. The group got acquainted with current situation of demonstration fields in the project site and discussed adoption of Conservation Agriculture in the Southern Kazakhstan Province. According to discussion of participants no-till drill was found suitable planter to plant maize in the project demonstration site. Local media representatives covered the field day and interviewed Dr. Theodor and Prof. Dossymbek.

Field day in Uzbekistan

A field day was organized on June 08, 2012. A field mission of FAO and a scientist from ICARDA scientist visited to oversee FAO GCP project activities in Uzbekistan. The mission was participated in a field day on demonstration of mungbean planting after winter wheat harvest with Brazilian zero till planter. The field day was organized on 08 June 2012 at Kasbi and Karshi sites, Kashkadarya province in collaboration with Ministry of Agriculture of Uzbekistan. The event was organized to introduce the new machines of conservation agriculture to farmers in the project demonstration pilot site and in whole Kasbi and Karshi

districts. Among the participants were, besides farmers and researchers, local Government authorities, specialists from Ministry of Agriculture, Agricultural Department of several provinces. The field day was well attended with approximately 70 participants. Governor of Kasbi district Mr. Furqat Sharipov, and M. Boyquvvatov, Director, UzCase plant, attended this programme. The first half day of the field day was devoted to plant mungbean right after harvest of winter wheat with zero-till drill while second half of the field day was devoted to demonstrate no-till winter wheat field performance in the project site.

Dr. Aziz Nurbekov briefed about the field day and explained its objectives, contents and target use. He highlighted during this day the participants of the field day will be discussed the planting of mungbean as a second crop and will be reviewed the current status project activities in the project pilot site in Kasbi and Karshi districts. Mr. Mr. Furqat Sharipov, Governor, Kasb district, he said that we are thankful to FAO for this confidence. Progress in this project in such a short time is needed quite praiseworthy – thanks to the excellent support of the ICARDA-CAC. The regional office is playing an important role to the implementation of the project. Then floor was given to Dr. Theodor Friedrich. He explained the need of conservation agriculture to the participants. Machines for Resource Conservation were also demonstrated to the participants. He highlighted how to switch the zero till Field Seeders from cereal to row crop, and also talked how to calibrate the seed and fertilizer rates. Then mung bean was seeded into wheat stubble.

A smaller group of farmers were taken to an on-farm site where wheat had been ZT seeded into cotton stubble. Considerable discussion took place around the issue of weed control. Late emerging weeds were an issue in the crop. Discussion of change on a system wide basis took place, which was a paradigm change in thinking for many of the farmers and NARS staff present, especially for a system that broke Agriculture into separate components instead of looking at agriculture as a system. Farmers were amazed to see the excellent winter wheat field performance. Farmers keenly observed the crop fields and made lot of queries on weed management in the conservation agriculture which was answered by Dr. David Feindel. Weed management issues and type of herbicides were also discussed with farmers. The participants clearly recognized the need for introducing conservation agriculture practices in the country. The event had a wide coverage by governmental channels on radio, TV and newspapers. National media interviewed ICARDA and FAO staff on the benefits of CA and the project, in general.

Field day in Azerbaijan, 4 Jun. 2012

Field day in Kazakhstan, 12 Jul. 2012

Field day in Uzbekistan, 08 Jun. 2012

ANNEX 3

FIELD TRAINING COURSES

Field training course in Azerbaijan

Field training course. A two day field course was organized jointly by ICARDA-CAC and Azerbaijan Agrarian Centre on July 19-20, 2012, Ter-ter and Barda, Azerbaijan. More than 40 participants including farmers, researchers and staff of Azerbaijan Agrarian Centre (List of participants annexed at end). There were four main themes in the training programme and these are as follows: a) Conservation agriculture technologies (direct seeding and no-tillage); b) Herbicides application; c) Water saving technologies; and d) Exploitation of boom sprayer.

Dr. Aziz Nurbekov (ICARDA-CAC) explained about the Conservation Agriculture for Irrigated Areas in Azerbaijan, Kazakhstan and Uzbekistan project as a whole as well as ICARDA-CAC programmes and activities being undertaken for rolling out Conservation Agriculture based activities in Central Asia and the Caucasus region and also objective of the training course. This training programme is not just learning on conservation agriculture and water management issues, but it is also to build confidence among the farmers and researchers with a strong knowledge base on conservation agriculture technologies. He described in brief about the project target activities in Ter-ter and Barda sites. It was emphasised that in the ensuing double cropping season, the major focus will be on accelerating adoption of crop diversification, herbicide application and water saving technologies in crop production like direct seeded maize, soybean, and sunflower after winter crops harvest in the project site.

As the main focus of the training course was for conservation agriculture and water saving technologies were explained to the participants by Dr. Seymur Safarli, Director Soil erosion and Irrigation Institute and National Consultant of the conservation agriculture project on Irrigation. He made several presentations on improved water management technologies in conservation agriculture and soil erosion issues. It was highlighted that conservation agriculture and water saving technologies are the need of the time in view of the declining water availability, labour shortages, decreasing soil fertility issues etc. For the benefit of the farmers, the results of the demonstration field trials on conservation agriculture and water saving technologies in Ter-ter and Barda sites during 2011-2012 were shared and discussed.

Dr. Maharram Director Regional Agrarian Center delivered his expert talk on technical specification of boom sprayer & use of this machine in maize field, which was planted after winter barley in the end of June, 2012. He also answered to the queries made by the farmers about boom sprayer, herbicide use.

A group visited several demonstration trials of the project, on direct seeded maize, soybean, buckwheat, sunflower and beans, across Ter-ter and Barda districts. Field performance of the crops was good.

On the request of farmers Dr. Aziz Nurbekov assured them help for availability of boom sprayers and zero-till drills. It was really nice to know that farmers are now taking keen interest in direct seeded maize.

Field training course in Kazakhstan

A training course on conservation agriculture in South Kazakhstan province

In the beginning of 2000s FAO, CIMMYT, Ministry of Agriculture, NARS initiated large scale Conservation Agriculture (CA) activities in North Kazakhstan. Due to these efforts, the area under CA-based practices has been increasing from 0 ha in 2001 to 1,600,000 ha in 2011 with continued increases in area according to a recent assessment conducted by CIMMYT. The utilization of CA-based technologies has become an official state policy in agriculture in Kazakhstan. Since 2008, the government of Kazakhstan has been subsidizing farmers who are adopting CA-based technologies. Kazakhstan made a great progress on conservation agriculture in Northern Kazakhstan while in South Kazakhstan in the irrigated conditions there is a need strong need for improvement of conservation agriculture. Main issues to be addressed in the future are: weed control; crop rotations; fertilization strategies; improved water management; training and awareness. A two days Conservation Agriculture training course was organized 11-12 July, 2012 at Sayram, South Kazakhstan province and attended. The main objectives of the training course are to discuss soil fertility and water management issues; and also to develop capacity of farmers, researchers and other stakeholders on conservation agriculture in the province. The thirty five participants came from various fields of agriculture—agronomy, soil science, irrigation, weed management, breeding, and extension represents research institutes, University, farmers' association and agricultural department of South Kazakhstan Province.

Inaugurating the training course, Dr. Ajar Karabalayeva, Scientific Secretary of South-Western Research Institute of Livestock and Crop Production and FAO GCP project consultant on irrigation, said that the crop production sector is dominated by cereal crops, mostly wheat, which accounts for 66% of the total crop output. Other important crops are fodder crops, potatoes and vegetables. Dr. Aziz Nurbekov emphasized the need to adopt conservation agriculture practices for efficient use of water and nutrients and preservation of natural resources. Dr. Rahimjan Medeubayev, FAO GCP project consultant on mechanization presenting a general overview of the training course, said that trainees from varied spheres including agronomy, soil science, irrigation, weed management, breeding and extension are participating in the course.

First day of the training course was devoted to theoretical part of the conservation agriculture while second day was devoted to practical courses in no-till planting of second crops, Visual Soil Assessment, water improvement technologies and operation, maintenance of a Brazilian no-till drill provided by the project. During this course, the participants are being exposed to different steps in implementation of key elements of CA in the project demonstration sites.

Drs. Ajar Karabalayeva and Aziz Nurbekov chaired a session on Visual Soil Assessment and crop rotation while Dr. Rahimjan Medeubaev chaired a session on machinery for conservation agriculture. The participants actively involved to the Visual Soil Assessment and they divided into two groups to work in the field to assess the soil of the project demonstration site. Then planting of mungbean as a second crop, where preceding crop was winter wheat, was demonstrated and also specifications of the no-till planter were discussed during this session. The participants also visited the farm of Ashurmetov Gayratjon, a farmer in Yassau settlement, who is a member of the project. He informed the difficulties he had to suffer the previous year due to the drought and water shortage that dried out the region. Besides, he pointed out that thanks to the use of bed planting technology, the crop yields in his fields were better than those of his neighbor farmers who are using traditional technology of winter wheat growing.

The awareness and adoption of conservation agriculture in South Kazakhstan province was discussed in length. Participants were actively participated and were happy to attend in the training course; and said thank to the organizers of the training course for arranging such kind of important event on conservation agriculture. They said that conservation agriculture is a challenge for the modern agriculture to improve soil fertility; to increase crop production; to efficiently use of water resource; and to decrease production cost of agricultural products.

Field training course in Uzbekistan

Another a two day field training course was organized in Karshi, Uzbekistan, on July 27-28, 2012, for 39 participants.

The field training course was focused on issues and concepts of practices of no-till, the technical aspects of double cropping as well as participatory research and extension methodology.

National consultants on agronomy, irrigation and project regional coordinator were delivered presentations, on planting methods, crop diversification, crop rotation, water saving technologies, technical specifications around sprayers, the weed management in conservation agriculture and herbicide application, during the first day of the training course. The presentations were very well received by the attendees (52). After the each presentation, questions were posed by the representative farmers of the Karshi, Kasbi and Nishon and researchers on issues of priority for development zero-till technologies in Uzbekistan, the role of no-till planting on crop rotation, herbicides application on conservation agriculture. At this session Dr Aziz Nurbekov of ICARDA made a statement on the terminology issues in Uzbek language since there is no suitable Uzbek translation for conservation agriculture.

The second day of the training course was devoted to see demonstration fields across Kasbi and Karshi districts where mungbean, maize, sunflower and soybean were planted with zero till drill after winter wheat harvest. Fields are prepared which were visited throughout the field training course, where participants were able to evaluate the interest and practicability of new technologies on their farms jointly with national consultants of the project in Uzbekistan. It should be mentioned here that field performance of the double cropped crops such as mungbean, maize, sunflower and soybean was good and farmers liked very much the plant performance in the field.

At the end this training course district authorities, national consultants, researchers joined to discuss results of conservation agriculture during the previous years in the project demo site. The direct involvement of agricultural scientists in the evaluation and adaptation of the new technologies at farm-level was promoted in this training course. The participants exchanged their views on promotion of conservation agriculture in the region. Specialists from farmers association of Kasbi, Nishon and Karshi districts also attended the field training course and expressed their willingness to see moving from conventional agriculture to conservation agriculture in near future.

Field training course in Azerbaijan, 12 Mar. 2012

Field training course in Kazakhstan, 12 Jun. 2012

Field training course in Uzbekistan, 26 Mar. 2012

Annex 4

Work plan and time frame of the activities

Outputs/Activities	2011												2012												2013								
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Output 1.1. . Improved crop production and management through accelerated adoption of conservation agricultural practices																																	
Activity 1.1.1: Award contracts to ICARDA and local consultants and establish project office at ICARDA, Tashkent office																																	
Activity 1.1.2: Engage local scientists for monitoring agricultural and economic parameters of the demonstrations																																	
Activity 1.1.3: Organize an inception workshop to discuss the detailed national and regional work plans																																	
Activity 1.1.4: Select the demonstration sites in each country and identify in a participatory manner the participating farmers																																	
Activity 1.1.5: Order required equipment, spare parts, seeds, herbicides and fertilizers																																	
Activity 1.1.6: Modify existing machinery/equipment for the use under CA system																																	

Output 1.2. Raised-bed planter and land levelling technology adjusted and applied and lower and more efficient water utilization for the crop rotations introduced, as compared to traditional cropping systems																																	
Activity 1.2.1 Carry out soil analysis in the selected farms																																	
Activity 1.2.2: Survey the selected farms																																	
Activity 1.2.3: supervise improved land preparation and direct seeding																																	
Activity 1.2.4: Training workshops on improved water, land and crop management																																	
Output 1.3: **Crop rotations diversified with crops suitable for CA**																																	
Activity 1.3.1. Carry out monthly on-farm training on water and crop management																																	
Activity 1.3.2. Carry out bimonthly field days during each cropping season in each country																																	
Output 1.4 Confidence of farmers, extensionists and other stakeholders on practicing principles of CA increased.																																	
Activity 1.4.1: Monitor growing conditions of crops on selected farms (demonstration and control plots)																																	
Activity 1.4.2: Economic analysis of production cost of																																	

introduced CA technology.																																
Output 1.5 Farmer-oriented brochures and guidelines on applying CA practices in irrigated and rainfed areas in the selected countries produced and printed.																																
Activity 1.5.1: Preparation of draft guidelines on improved land, water and crop management through CA technology.																																
Output 1.6 Capacity building activities in the area of CA designed and carried out at the benefit of farm households and national partners																																
Activity 1.6.1 Organize at least one quarterly field day during the cropping season on each demonstration field in each country.																																
Activity 1.6.2: Organize one final assessment workshop in each country to disseminate project's results with participation of all stakeholders and related civil societies.																																
Design zero till drill in Uzbekistan																																
Inception report																																
Final evaluation																																
Final workshop																																
Prepare publications																																
Final report																																