

IPM CRSP Trip Report

Country Visited: Tajikistan

Dates of Travel: 4 June, 2011 - 13 June, 2011

Travelers Names and Affiliation: Frank Zalom, University of California, Davis

Purpose of Trip: Training and Research Planning associated with Central Asia IPM CRSP

Sites Visited: Dushanbe, Hissor District, Muminabad District

Description of Activities/Observations:

June 6 - *Presentations by IPM CRSP for Central Asia team members on the wheat, tomato, and potato packages.* The IPM CRSP Central Asia scholars each presented updates of collaborative research, training and outreach activities related to each crop. Barno Tashpulatova and Ravza Mavlyanova presented the update on the tomato package and associated research, and provided results of studies on biocontrol of soil pathogens with *Bacillus subtilis* and *Trichoderma*, foliar applications of microbial preparations, and tomato grafting to *Fusarium* resistant tomatoes. There are 2 field sites and two greenhouse sites in the current year to demonstrate elements of the tomato package. Two MS students at Tashkent Agrarian University are pursuing degrees with research theses related to the IPM CRSP; tomato grafting and improved whitefly parasitoid rearing.

Collection of field samples for diagnostic workshops. In preparation for the hands on diagnostic workshop laboratory sessions, the group traveled to the field to collect samples of wheat, potato and tomato insects and diseases. Soil samples were also collected for nematode extractions. Of

particular note was the ease with which virus symptoms were found on many of the vegetable crops, especially potato and onion.

Visit with Akhmedov Tursun Abdelloevich, Director, Institute of Horticulture & Vegetable Growing, Tajik Agriculture Academy. In the evening, members of the tomato IPM CRSP team visited with Dr. Abdelloevich to discuss future collaborations, especially tomato grafting in Tajikistan.

June 7 - Opening session. The opening session, workshop presentations and hands-on labs took place at Tajik National University (TJU). There are 20,000 students at TJU, and it is only about half built. The Rector, Professor N.S. Saidov, welcomed everyone to Tajikistan and the workshop. There is interest in international assistance to produce sugar beets and corn to be used as a domestic source of sugar which does not exist at present. Potatoes and tomatoes are also on his list. His dream is to have processing plants for potato chips and catsup. He spoke about how global warming will affect Tajikistan and how it will change agriculture. The country is receiving \$50 million from the EU for global climate change including studies of the melting glaciers in the Pamir. TNU will draft an MOU for cooperation with each of the universities working with the IPM CRSP for Central Asia Academician H.K. Akhmadov, President of the Tajik Academy of Agricultural Sciences mentioned that the Tajik Agrarian University would like to built its biological sciences capacity. Dr. R.N. Muniappan spoke about the IPM CRSP Program on behalf of the Management Entity at Virginia Tech, and provided an overview of regional and global theme programs. Dr. Karim Maredia spoke on behalf of the Central Asia team to update the Rector and others present on goals of the IPM CRSP in Central Asia, especially with regard to Tajikistan.

Pest diagnostic workshop overview presentations. The presentations were well attended not only by formal workshop participants from the 3 Central Asian countries, but also by a number of TJU faculty and students. Formal presentations were given on Plant Pathology (Megan Kennelly) and George Bird (Nematology). Following lunch, the workshop

presentations were made in classrooms of the new building at TJU, and students were given options of 2 presentations to attend on other areas of diagnostics.

June 8 - *Continuation of pest diagnostic workshop overviews and hands-on diagnostic exercises.* The day began with overview lectures by Megan Kennelly and Naidu Rayapati on diagnostics of fungi and bacterial pathogens using potato, tomato and wheat as examples, and diagnosis of viruses. The afternoon was filled by hands-on diagnostic labs to train the participants in entomology, nematology, plant pathology and viruses using the samples that we had collected from the earlier field visit and techniques. The workshop attendees split into 4 groups that rotated between each diagnostic area. The numbers in each workshop group swelled with the addition of faculty and students of the School of Biological Sciences.. I worked with the Naidu Rayapati on virus diagnostics. I was impressed by the enthusiasm of the students who attended these sessions, particularly noting that the women students participated fully in questions and discussion. Since there is no virologist in Tajikistan, the materials were new and fresh to them. One faculty member asked for the remaining immunoassay strips to use for classroom demonstrations, and workshop participants from Kyrgyzstan asked for strips to test their own potatoes for PVY.

June 9 - *Field visits to wheat and tomato demonstration sites in Hisson District.* An IPM CRSP experiment to show impacts of flowering medicinal plants used to attract and service beneficial insects in the wheat system was the site of the first stop. The farmers in this area who spoke about the plots recognized the purpose of the experiment and seemed enthused about creating such natural processes associated with their crops. They mentioned that there was no difference between areas with nectar plants and those without. Mustapha El-Bouhssini, a member of our IPM CRSP team, said that the original procedures for plot design were not followed which contributed to the outcome. Several of us noted that alfalfa completely surrounded the wheat and could have also provided beneficial insects to the plots masking effect of the in-field insectary. The tomato site was a variety trial with 4 varieties and no replication. Our IPM

CRSP tomato team had not contributed to the design of this site. There appeared to be weakened plants in this field that appeared to be caused by abrasions to the main stem of affected plants. We had thought that these were mechanical but it was pointed out to us that there is some beetle that comes up from the ground to feed on stems. We had not seen this insect. I was asked to identify an aphid present in the field, and it appeared to me to be cotton aphid. Most of the aphids were dead and I asked what they had sprayed previously, I couldn't understand product names used, but could tell that it was a neonicotinoid by the method of application. I did note some evidence for virus in the field, and Naidu Rayapati confirmed that indeed there were mosaic symptoms. Some foliar biopreparation was also being applied to the plants, but we could not determine what it was. There is need to find out more about insecticides and biopreparations being applied to the tomato crop and I have asked Barno Tashpulatova to try to list products used, their active ingredients and targets.

June 10 - Group discussion of future research collaboration strategic plan for the University of Central Asia's (UCA) Mountain Societies Research Center (MSRC) in Dushanbe. We met with the Director and the Deputy Director for Research for the University of Central Asia's (UCA) Mountain Societies Research Center (MSRC) in Dushanbe. This is a new facility still in development, and will officially open on June 19. UCA-MSRC was interested in discussing what is the purpose of a research center with the IPM CRSP for Central Asia team. Chad Dear, the Deputy Director for Research facilitated the meeting. He provided an overview of the vision for UCA, which is being developed in partnership with the Aga Khan Development Network. Established in 2000, UCA was described as a 'university in the making'. It will have campuses in Khorog, Tajikistan, Naryn, Kyrgyzstan, and Tekeli, Kazakhstan. Its central administration is located in Bishkek. There will also be 'learning centers' in Bishkek and Dushanbe. There is a faculty development program that sends students to partner institutions for PhDs with a goal of having them return to teach at UCA. The undergraduate program will begin in 5 years. At the UCA-MSRC there will be a MS program in sustainable mountain

development with a goal of preparing professionals to take positions in government, at NGOs and as entrepreneurs. UCA-MSRC hopes to establish a sound academic research program with clear applied outputs. UCA also has an International Research Fellows program, essentially post-docs that are connected with individuals at partner universities.

It was mentioned that at a 2011 conference of the European Bank for Reconstruction and Development there was interest in private investment in fruit processing in Tajikistan, particularly with fruit and vegetables. Dried fruit is a valuable niche market, with Russia being a prime export market for apricots and raisins.

Open lecture on virus diseases and their impacts and management by Professor Naidu Rayapati at Tajik National University. There were supposed to be 3 concurrent lectures open to students and faculty at TJU and I had prepared one of these on Biological Control. In the end, only one room and interpreter was available, so we suggested that the students present in the lecture hall vote on which talk they wanted to hear. We noted that this was the democratic thing to do, while a few locals joked that this was not the norm. The students and others in attendance voted for the virus lecture, and the room was overflowing with 67 people in attendance. Clearly this supports that there is an interest in virus diseases as mentioned previously, and this topic was selected for presentation. I think that this sort of intensive training on plant viruses would be welcome in all of the Central Asia republics.

The institutional visit to the university was followed by dinner at the Dushanbe Teahouse offered by the Rector of the university.

June 11 - *Visit to the IPM CRSP potato research and demonstration site in Muminabad District.* The Muminabad District is a 5 hour drive south southeast of Dushanbe. The roads are mostly 2 lane and rough. On the way south, we saw the reservoirs formed by a series of dams, one of which is the tallest dam in the world (it is earthen-filled). The lake is said to have a useful life of 100 years, but according to our interpreter it only holds 60% of what it did initially because of silt. Erosion appears to be a

big problem. The steep hillsides are largely soil and stones that erode easily. In some areas, we saw pistachios (rain fed) planted on hillsides specifically to hold soils in place. These are harvested privately but half of profits must be shared with the government. We traveled through some large, fairly level areas that were arable but clearly dry. Salt could be seen on the fields probably the result of irrigation. There is also a 'mountain of salt' in the area that can be seen from the road that is described as having springs that emit salty water. We arrived at the potato site which is on a farmer field in close proximity to the Afghanistan border. The site is at a higher elevation and has a large reservoir with a plentiful water supply provided through pipes and hydrants built during the Soviet era. The farm had a mix of vegetables and fruits, with a number of honeybee hives. As was the case with the tomato experiment at Hisson, there were 4 varieties grown in unreplicated plots. The IPM focus of these plots was not clear. The government researcher who was supervising the plots responded to a question concerning viruses present by saying they did not have viruses. Naidu Rayapati confirmed the presence of PVY using the test kit he brought throughout the site. They receive their seeds from Holland as do many of the farms that we visited previously, and it is likely that seeds that are purchased are already infested. Development of a certification program for Central Asia as proposed is clearly warranted.

June 12 - *Updates and discussions with IPM CRSP for Central Asia team members affiliated with Global theme projects.* Findings and recommendations from gender specialists Professors Linda Racioppi and Zahra Jamal reflecting observations from 2010 and 2011 field visits as well as summaries of extensive reviews of documents reflecting demography and gender issues from the region were presented to the team. I found their work careful and useful. Their interaction with women farmers during our field visits was inspiring, and they had to overcome a number of distractions in order to complete their work at virtually every stop. I learned a number of things during the course of the week, and I would like to make sure that we implement their recommendations for separate training of women farmers at field days and trying to use women as interpreters or if necessary to have a woman

as an intermediary with a male interpreter. I hope that somehow we can keep Zahra involved with the Central Asia team after she takes her new position at the University of Chicago.

Findings and recommendations from virology Professor Naidu Rayapati reflecting observation from this 2011 visit were presented to the team. Dr. Rayapati described the Virus Global Team structure and noted that this was the first opportunity for collaboration with the Central Asia team. He sees tremendous problems and opportunities across all countries of the region, particularly in potato and tomato crops. He recommended that virus issues related to wheat be covered by the ongoing programs of ICARDA. He plans to visit Uzbekistan and Kyrgyzstan in 2012 for training and to develop research collaborations with IPM CRSP for Central Asia team members. His suggestions were welcomed by the Central Asia team. I hope to send our Uzbekistan PhD student to visit his lab later this summer for training in the blot method of collecting samples and in conducting simple field tests so that he can effectively apply these to the tomato system when he finally returns to conduct field research in his country.

Training Activities Conducted

Program type (workshop, seminar, field day, short course, etc.)	Date	Audience	Number of Participants		Training Provider (US university, host country institution, etc.)	Training Objective
			Men	Women		
Workshop	8 June, 2011	IPM CRSP invitees from Uzbekistan, Kyrgyzstan & Tajikistan; students from Tajik National University			IPM CRSP for Central Asia	IPM Training - Viruses

Suggestions, Recommendations, and/or Follow-up Items:

The timeframe for current ambitions in field demonstrations that envision comprehensive sites across all countries of the region should be extended to reflect realities of budget and difficulties of travel and site differences within the region. IPM CRSP research planning should explore training of local university students at the MS level in projects related to future activities. Excellent suggestions by the gender specialists associated with the Central Asia team for conducting training for women should be implemented, especially the idea of holding separate training for the women and using female interpreters and other findings. Additional diagnostic workshops would be useful in Kyrgyzstan and Uzbekistan, especially in plant virus diagnostics. It was clear that there was little knowledge of serology and other techniques for viruses, or even that viruses were so common in potato and tomato crops (and other local crops as well). A survey of viruses in IPM CRSP crops in Central Asia would provide good baseline information for future research and training. Knowledge of nematodes is also lacking, and nematode diagnostics and research on control strategies that could be incorporated into packages for tomatoes and potatoes is needed. Follow up with University of Central Asia for potential collaborations would be useful.

List of Contacts Made:

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