

Fifth Year

Quarterly Activity Report No. 3

January-March, 2007

**Food Security in Bangladesh:
Improving Wheat, Maize and Papaya Production,
and Impacts of Arsenic Contamination**

USAID Grant No. 388-G-00-02-00070-00



Submitted by
International Maize and Wheat Improvement Center (CIMMYT)
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Introduction

The period July 2006 to June 2007 is the last year of the five year project “Food Security in Bangladesh: Improving Wheat, Maize and Papaya Production and Impacts of Arsenic Contamination”. This project is financed by USAID Grant No. 388-G-00-02-00070-00. All components of the project ended by June 2006, except “Papaya Improvement through Ring Spot Viral Disease Resistance”, which continues until June 2007.

Additionally the CIMMYT Office in Bangladesh has continued to support some follow-up activities related to these three components of the project:

1. Facilitation and Promotion for Adoption of Mechanization by Growers
2. GIS - Bangladesh Country Almanac (BCA)
3. Whole Family Training in Maize.

In this report for the third quarter (January-March) of the 2006-07 year, we describe the papaya project achievements and highlight some interesting follow-up activities from the other components. A budget summary is also given.

The farm machinery, the BCA and whole-family training in maize continue to generate interest among the stakeholders. The impact of the technologies developed and disseminated with financial support provided by USAID remains clear and in some cases has been expanding.

CIMMYT Office in Bangladesh, Dhaka, 24 April 2007

GIS-Bangladesh Country Almanac (BCA): A User Friendly GIS Tool for Agricultural, Forestry and Natural Resource Management

The Bangladesh Country Almanac (BCA) project ended in June 2006. No training program on BCA was organized this quarter except some demonstrations to individual users. The users are still communicating with the CIMMYT Office in Bangladesh and partners' offices for troubleshooting, new license code and further development of BCA.

Demonstration and troubleshooting

There was a training program on wheat improvement for newly appointed scientists from February 11 through 15, 2007 at Wheat Research Centre, Dinajpur. Based on the scientists' request, a demonstration of Bangladesh Country Almanac was made. The young scientists seemed to be very excited to see the datasets and its spatial queries and analysis through the software 'AWhere-ACT'.



Figure 1: BCA 3.0 demonstrated to the newly appointed scientists at Wheat Research Centre, Dinajpur

Since the release of BCA version 3.0, many requests came from the Hazi Mohammad Danesh Science and Technology University (HMDSTU) to organize a 2-day training course on the latest BCA release for the professors, MS and Ph.D students. It was not possible to plan for such training due to fund unavailability. However, a short demonstration program was conducted with the HMDSTU.



Figure 2: BCA 3.0 demonstrated to the academicians of HMDSTU

Individual demonstrations on BCA were organized for the interested users' based on their requests. Most of the users asked about problem solving and how to establish new datasets of their own in their working locations.

Database

Area, Production and Yield data for the following crops for 2006-07 have been obtained by Zila/Upazila and passed to the concerned users:

1. Aus(HYV and LV)
2. B.Aman
3. T.Aman(HYV)
4. T.Aman(LV)
5. Maize summer
6. Mung Summer
7. Ground Nut Summer
8. Sesame Summer
9. Chilli Summer
10. Vegetable Summer
11. Jute

Software License Distribution

A new BCA software license code has been issued which will expire on January 1, 2008. Those users registered with CIMMYT Bangladesh/BARC will get the renewal automatically and others can be supplied on request. This renewal system has been developed to get responses from the users.

Whole Family Training in Maize

Under USAID grants, significant activities on maize research and development were implemented until June 2006. Since then some follow up activities have been undertaken. Some activities which we were jointly implementing with partners since 2001 are now continuing with resources from the partners. We are trying to provide them all assistance possible to intensify and diversify maize production.

CIMMYT in collaboration with the Plant Breeding Division of BARI set up three new maize trials in different agro-ecological environments during November 2006 to evaluate new maize varieties. After an evaluation of the entries, suitable varieties will be selected.

Fifteen demonstration plots with BARI hybrid maize 5 (BHM 5) and BARI maize 7 (BM 7) varieties were set up in December 2006 in the hilly area of Bandarban district through the Integrated Development Organization (IDO). The results of the demonstrations will be obtained after harvest of the crop early in May.

CIMMYT HQ have developed and tested a web based knowledge portal for maize and wheat, which will be a useful resource for scientists and extensionists. Maize and wheat information have been kept separately as Maize Doctor and Wheat Doctor. Dr. Petr Kosina, Training Coordinator, CIMMYT HQ, visited Bangladesh from March 20-26, 2007 to obtain necessary inputs from the NARS scientists for improving the Maize and Wheat Doctors. He met scientists of BARC, BARI, BRRI and IRRI, and got valuable inputs. CIMMYT HQ has sponsored the visit.

With non-USAID funding, the CIMMYT staff member for maize at our Bangladesh Office participated as a resource person in training on maize data management, analysis and interpretation from March 29-31, 2007 in Nepal. About 26 maize scientists of the National Agricultural Research Council (NARC) attended the training.

Development of Ring Spot Virus Resistant Transgenic Papaya in Bangladesh

Help the GOB implement intellectual property rights

Craig Meisner made several visits to BARI and finally the application was approved by BARI biosafety committee and sent to BARC for a national biosafety meeting on April 8th. During the visit of Drs. John Duxbury and Julie Lauren, we together met with the BARC EC and MD Crops, Drs. Nurul Alam and M.A. Razzaque. BARC felt hesitant whether if they sent the application to the MOA, they could get approval before the project ending date of June 30, 2007. They asked if seed would/could be sent after that date, and we assured that most likely that would be the case, assuming BARI would be willing to continue the work unfunded.

BARI was unable to give any commitment for biotech work with its own resources. The result of the meeting at BARC on April 8th was that the application will not be sent to the MoA. Craig Meisner had a meeting on April 17th with Dr. Al Amin and with the DG and Director of Research of BARI to understand the reasons for their decision and to discuss the ramifications of the committee's decision.

Thus, during the last stages of this project, we are changing the strategy because BARI cannot fund and commit to this biotech opportunity. We will formally approach the East-West Seed Company who has agreed to continue to work on transgenic virus-free papaya at their own cost. They are willing to pursue the application to BARC and the MoA. Thus, though it is regrettable that BARI's delays on the application and recent decision will not advance the use of this proven biotech crop within the institute, we are grateful that we may be able to launch the crop through the private sector where they have the funds and commitment to give this transgenic a chance in Bangladesh.

Drs. John Duxbury and Julie Lauren were able to meet with Dr. Robert Bertram, CGIAR rep from USAID Washington, and with USAID Dhaka personnel as well, where the above issues were discussed in detail.

Testing of transgenic lines at USDA /BARI

PRSV isolates S3 (from BSMRAU), S11 (from BARI), and S17 (from BADC) were inoculated to transgenic KpKKTV-11H-305, KpKKTV-111H-18 and KpKKT-95H-165, and to SunUp. A delay in infection of 28 days was observed on transgenic lines KpKKTV-11H-305, KpKKTV-111H-18 and KpKKT-95H-165 that were inoculated with strain S3. At 64 days, one of the four inoculated plants of KpKKTV-111H-18 still did not show symptoms. Furthermore, the symptoms induced by S3 were mild. These results were similar to those observed for the Mexico strain of PRSV that was inoculated to the same lines. There was a lesser delay of symptoms with

plants inoculated with strain S17 and almost no delay of symptoms on plants inoculated with S11. S11 and S17 induced severe symptoms on transgenic lines. Our data suggest that the PRSV strains in Bangladesh are variable and that the transgenic lines may show suitable resistance to S3. The results point to the need to do confined field tests in Bangladesh to assess first hand the performance of the lines. The coat protein sequences of the S3, S11, and S17 strains will be determined after we get settled our new lab.