ABSP II
Southeast Asia
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Eggplant License Agreement Signed

The license agreement for ABSP II's Fruit and Shoot Borer-Resistant (FSBR) Eggplant was signed January 30, 2006 at the Conference Room of the Office of the Chancellor, University of the Philippines, Los Banos (UPLB).

The Agreement was among the Maharashtra Hybrid Seed Company (MAHYCO), represented by Dr. Brent Zehr, Joint Director for Research; Sathguru Management Consultancy Private Limited, represented by Director Kannan Ragunathan; and UPLB, represented by Chancellor Rey Luis I. Velasco. Dr. Ronnie Coffman, co-director of ABSP II and director of the International Programs of the College of Agriculture and Life Sciences, Cornell University, signed as ABSP II witness. Dr. Desiree Hautea, director of the Institute of Plant Breeding, UPLB (IPB-UPLB), signed as witness for the university.

Also present at the ceremony were Dr. Cecilio Arboleda, Executive Director of UPLB-Foundation Incorporated; Dr. Enrico Supangco, Vice-Chancellor for Research and Extension; Dr. Rita Laude, Vice-Chancellor for Instruction; Dr. Florinia Merca, Director of the Office for Institutional Linkages; and Professor Stella Tirol, Director of Public Relations.

The sub-licensing agreement signed by UPLB and the Indian counterparts, MAHYCO and Sathguru, will expedite the transfer of the seeds of the crosses produced between the MAHYCO Bt parental line and selected Philippine varieties. Likewise, the agreement will facilitate the commercialization in the country of the Bt eggplant varieties that will be developed using the Bt technology from MAHYCO-Monsanto.

Formal signing of the sub-license agreement among UPLB, Mahyco, and Sathguru. Standing, from left to right: Drs. Cecilio Arboleda, Florinia Merca, Enrico Supangco, Rita Laude, and Desiree Hautea. Seated, from left to right: UPLB Chancellor Luis Rey Velasco, Mr. Kannan Ragunathan, and Dr. Ronnie Coffman.

External Reviewers Complete Mid-Term Program Evaluations of ABSP II – Philippine Projects

Two independent external review teams visited the Institute of Plant Breeding (IPB) at the University of the Philippines Los Baños (UPLB) on two separate occasions to review the developments and accomplishments of ABSP II- funded projects and other initiatives. Dr. Julian Adams of the University of Michigan came on January 19, 2006; while Prof. Paul Teng of Nanyang University, Singapore, and Dr. John Howard of the Applied Biotech Institute, Texas conducted their evaluation on February 26, 2006.

Dr. Ronnie Coffman, Co-Director of ABSP II, also visited IPB on January 30, 2006 to look into the progress of all ABSP II-funded projects. Dr. Coffman also signed as witness for ABSP II during the signing of the sub-license agreement among UPLB, MAHYCO, and Sathguru on the same date.

On all occasions, reports were presented by the principal investigators of the following ABSP II projects: 1) Dr. Josefina O. Narciso for the development and commercialization of fruit and shoot borer-resistant (FSBR) eggplant in the Philippines; 2) Dr. Pablito M. Magdalita for product development for papaya ringspot virus (PRSV)-resistant papaya in the Philippines; and 3) Dr. Hayde F. Galvez for the development and commercialization of

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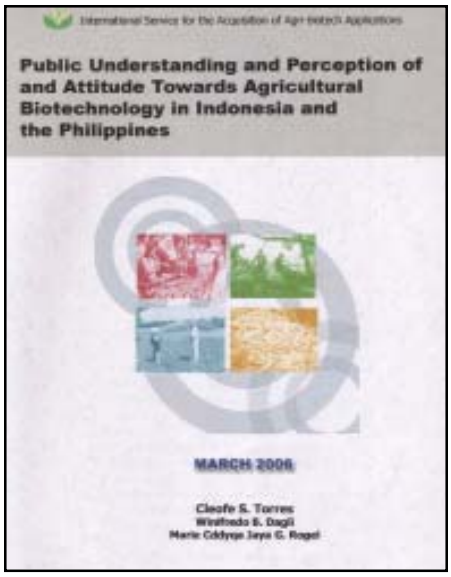
Public Perception Studies on Biotech Completed

What do stakeholders in Indonesia and the Philippines generally know or understand about agricultural biotechnology? What are their sources of information on the topic? These were some of the questions that were answered by a recently completed study of the public's understanding, perception, and attitude toward agricultural biotechnology in the two countries conducted by the College of Development Communication, University of the Philippines Los Baños, for the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and the Agricultural Biotechnology Support Project II. This is a follow-up of a 2002 five-country Asian study conducted jointly with the University of Illinois at Urbana-Champaign.



Philippine respondents' personal ratings on their understanding and knowledge of science and agricultural biotechnology were moderate. They regarded themselves as having adequate understanding and some knowledge of science. Policy makers, extension workers, and farmers obtained relatively high scores on a pop-quiz to determine their knowledge on the matter. Generally, respondents had a positive perception of agricultural biotechnology and were moderately or highly interested in it.

The main sources of information on biotechnology were the mass media (radio, television, and newspaper) and interpersonal sources (friends, relatives, experts, and professionals) although exposure was low. University scientists were still the most trusted and sought-after information source.

On the other hand, there was a modest improvement in the Indonesian respondents' level of understanding of biotechnology. From a self-rating of 'low' to 'moderate' understanding of science and technology in 2002, they unanimously claimed to have obtained 'moderate' knowledge about the use of biotechnology in food production in 2005. Upon validation, most of the respondents in all the stakeholder groups had correct understanding of biotechnology. Degree in interest in biotechnology was rated moderate, with most respondents not appearing to be overly concerned with the use of agricultural biotechnology in food production.

While mass media was found to be the main source of information on biotechnology in 2002, the 2005 study found that no single source of information on biotechnology stood out among the stakeholders. It is interesting to note, however, that stakeholders were starting to recognize religious leaders or figures as potential sources of biotechnology-related information. As with the Philippine study, university scientists were perceived as the most trustworthy sources of information about biotechnology.

External Reviewers Complete... from page 1

multiple virus resistant (MVR) tomato in the Philippines.

The accomplishments of other components of the product development were also reported. Mr. Panfilo de Guzman, an associate scientist of the International Service for the Acquisition of Agri-Biotech Applications (ISAAA), reported on the socio-economic studies done; while Dr. Mariechel J. Navarro, manager of ISAAA's Global Knowledge Center, reported on the communications work undertaken for ABSP II.

Each member of the review team gave their comments, suggestions, and clarifications on the different activities.

Also included in the program evaluation were visits to the 1) laboratory mass-rearing set-up of fruit and shoot borers; 2) virology screenhouse of the MVR tomato project; and 3) Biosafety Level 2 (BL2) greenhouse for the PRSV-resistant papaya project. ❑

Reviewers visit the PRSV papaya BL2 Greenhouse set. Left to right: Dr. John Howard, Ms. Lolita Dolores, Prof. Paul Teng, Dr. Pablito Magdalita and Ms. Abigail Oropesa.

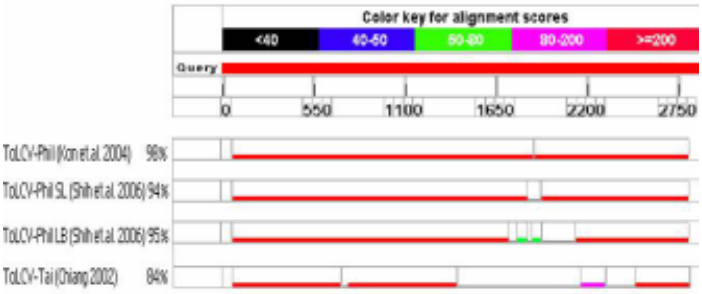
MVR Tomato (Philippines) Project Update

Sequencing Reveals Genome Variations in Philippine ToLCV

The near-complete genome of the Tomato Leaf Curl Virus (ToLCV) has been cloned from field isolates collected in several tomato production areas in the Philippines. Based on initial DNA sequencing, a range of genome variation has been observed among Philippine ToLCV isolates.

The viral genome of the Bulacan and Nueva Vizcaya isolates were found to have 94-98% and 92-95% homology with published sequences of Philippine ToLCV, respectively. Pairwise alignment between Bulacan and Nueva Vizcaya ToLCV sequences also showed 94% sequence homology. This range of genome variation will be confirmed with the Misamis Oriental, Bukidnon, and Baguio isolates of Philippine ToLCV.

By pairwise sequence alignment, the Bulacan and Nueva Vizcaya ToLCVs were only 84 and 86% homologous with the published Taiwan ToLCV genome, respectively. Based on the current sequence information, the Philippine ToLCV is clearly different from the Taiwan strain.



BLAST analysis of Bulacan ToLCV isolate. Sequence comparison shows that the Bulacan isolate is closely related to Philippine ToLCV, but very much different from its Taiwan counterpart.

Enhanced Collaboration Pushes ToLCV Resistance Breeding in Tomato

Collaboration among partners of the ABSPII-Southeast Asia Multiple Virus Resistant (MVR) Tomato project has been enhanced since the Project Coordination Meeting held January 10-11, 2006. Major collaborative efforts include: 1) the standardization of Tomato Leaf Curl Virus (ToLCV) screening protocols; 2) development of molecular markers; and 3) follow-up dry season field screening for the Philippine team's cultivars.

A standard screening protocol for ToLCV resistance in tomato has been established through the technical inputs of the Philippine and Indonesia MVR Tomato teams, and the Asian Vegetable Research and Development Center (AVRDC), Taiwan. Dr. Filomena C. Sta. Cruz laid out the initial draft based on the standing protocol used and provided by the AVRDC. Through electronic mails, month-long comments and reviews from all project partners were consolidated by Dr. Sta. Cruz to come up with the protocol, which will be used by the Philippine and Indonesian MVR Tomato teams. This is timely, especially for the Philippines, since ToLCV screening has to be conducted during the summer months, when the whitefly population is at its peak. Whiteflies are the vectors of ToLCV.

Dr. Melquiades Reyes assesses disease reactions of tomato parental lines against local ToLCV in a field trial.

The development of molecular markers linked to ToLCV resistance is also being fast-tracked by the MVR Tomato teams. Dr. Peter Hanson of the AVRDC supplied the teams with the introgression lines and appropriate controls. These tomato lines will be screened in each country to identify the genome regions that confer resistance against each local ToLCV. Reliable DNA markers are also being developed for each identified genome (introgression) region. If validated, these markers will be used to effectively and efficiently incorporate ToLCV resistance in target tomato genotypes.

As a continuing joint effort of the Philippine MVR Tomato team and the East-West Seed Company Philippines (EWSC-Phil) to develop a ToLCV-resistant tomato variety for the country, the MVR Tomato team set up its follow-up dry season ToLCV field screening of tomato parental lines at the EWSC R&D farm in San Ildefonso, Bulacan, Philippines. Initial evaluation conducted on March 10, 2006 confirmed that identified tomato lines were resistant to ToLCV, consistent with the results of the first trial in 2005's off-season. Additional resistant lines have also shown promise for gene pyramiding work.

Through further local collaboration, a second set of pollination blocks were also set up by the Philippine team in the greenhouse and field at the Benguet State University (BSU) Research Station, La Trinidad, Benguet. This is to seed increase the selected ToLCV resistant lines and advance breeding activities toward the development of an MVR tomato variety.

PRSV-resistant Lines Ready for Harvest

The product development team of the papaya ringspot virus (PRSV) resistant papaya project expects to harvest the T3 generation transgenic lines of "Davao Solo" in May to June, 2006.

The T3 generation transgenic lines are products of the purification work conducted from October 2005 to January 2006 on selected T2 lines. Selection was based on polymerase chain reaction (PCR) analysis of the introduced gene, resistance of the lines to PRSV, and agro-morphological traits. Purification involved pollination and fertilization of the selected line by its own pollen.

Transgenic papayas in IPB BL2 greenhouse

Fully developed fruits containing the T3 generation seeds will soon be harvested. At present, some of the pollinated fruits of the selected lines have a tinge of yellow color near their tips, indicating that they are ready for harvest. Other fruits are either at the mature green stage or at the developing stage.

As part of line maintenance, the selected T2 lines bearing the T3 generation seeds were duplicated by micropropagation. That is, young shoots emerging from the nodes of the selected line were harvested during the active growth stage, then cloned in tissue culture under aseptic conditions in the laboratory. These shoots are presently being allowed to elongate, and to have vigorous leaf growth before they are finally rooted to become whole plants, and serve as duplicate copies of the original selected line.

In addition, the same selected lines were duplicated by approach grafting or inarching: young and actively growing shoots of the selected transgenic line were joined to a papaya seedling, so that when the two would finally be attached, the transgenic shoot would be detached from the selected line. This inarched plant will serve as another duplicate copy of the selected transgenic line. Such duplicate plants are being produced to serve as sources of DNA materials for use in molecular analysis of the selected candidate lines.

Further molecular characterization of the transgenic candidate lines, by PCR and Southern blot analysis of the various generations, is actively being pursued. These, along with the environmental data, are being prepared to comply with requirements of regulatory agencies. Once completed, limited field trials of the candidate PRSV-resistant lines may begin.

Integrity of PRSV-Coat Protein Gene in Transgenic "Davao Solo" Papaya Established

Results from polymerase chain reaction (PCR) analysis and DNA sequencing have confirmed that resistance of selected lines of transgenic "Davao Solo" papaya to the papaya ringspot virus (PRSV) is mediated by the introduced PRSV-coat protein gene!

The development of transgenic PRSV-resistant "Davao Solo" papaya is based on the concept of pathogen-derived resistance (PDR). The coat protein (CP) gene of a Philippine PRSV strain (Bulacan isolate) was introduced to the "Davao Solo" genome via *Agrobacterium* transformation. As expected, the introduced PRSV gene disrupted the host-parasite relationship, resulting in the transgenic papaya's resistance to the virus.

Candidate transgenic "Davao Solo" papaya lines were selected based on their resistance to PRSV, and the presence of the CP transgene, as detected by PCR analysis. The CP fragment was amplified from transgenic papaya DNA and the positive control (plasmid DNA containing the PRSV-CP gene used in transformation), but not from untransformed papaya.

The integrity of the amplified CP transgene is now established! PCR fragments of the CP from these candidate transgenic lines were cloned and sequenced. Based on the generated sequence and by pairwise alignment, the PCR fragments were 98-100% identical to the original PRSV-CP sequence used to transform the "Davao Solo" papaya.

ABSPII is a USAID-funded consortium of public and private sector institutions that supports scientists, regulators, and the general public in developing countries to make informed decisions about agricultural biotechnology. Where demand exists, ABSPII focuses on the safe and effective development and commercialization of bio-engineered crops as a complement to traditional and organic agricultural approaches. The project helps boost food security, economic growth, nutrition, and environmental quality in East and West Africa, Indonesia, India, Bangladesh, and the Philippines.

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