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BC1 Seeds of FSBR Eggplant Turned Over to Philippine Collaborators

The BC1 seeds of fruit and shoot borer-resistant (FSBR) eggplant were turned over to the Philippine collaborators of the ABSP II-FSBR project on June 7-10, 2006. The Philippine team was represented by Dr. Desiree M. Hautea, Product Manager and Regional Coordinator of Agricultural Biotechnology Support Project (ABSP) II-SEA, and Dr. Josefina O. Narciso, leader of the FSBR Eggplant Project. The turn over coincided with their official trip to the Maharashtra Hybrid Seeds Company (MAHYCO).

The seeds were generated by backcrossing the F1 crosses between the Philippine eggplant varieties and MAHYCO Bt donor line with the Philippine recurrent parents. They were presented, along with the required Phytosanitary Certificate, to Drs. Hautea and Narciso by Dr. Usha Barwale-Zehr and Dr. Brent Zehr, Joint Directors for Research of the MAHYCO Research Center.

The BC1 seeds were obtained by the ABSP II project following the required process of the National Biosafety Committee of the Philippines (NCBP) and the Bureau of Plant Industry - Plant Quarantine Services (BPI-PQS), the country's regulatory bodies. The NCBP gave its approval for the contained trial of the seeds in November 2005, while the BPI-PQS granted the import permit in December of the same year. Three requests for extension of the import permit were submitted, with the last one made in view of the recent requirements of the regulatory bodies in India for the export of seeds. This extension will be in effect until July 8, 2006.

Turn over of BC1 seeds at the MAHYCO Research Center. MAHYCO Joint Directors for Research Dr. Brent Zehr (extreme left) and Dr. Usha Zehr (third from left) with Drs. Desiree M. Hautea and Josefina O. Narciso.

All the required post entry procedures were followed. The seeds were inspected at the BPI-Post Entry Quarantine Station, Los Baños on the first working day after they returned from their trip. The seeds were inspected at the BPI-Post Entry Quarantine Station, Los Baños on the first working day after their trip. A formal report of the entry of the seeds was also forwarded to the Bureau of Plant Industry.

Indonesia Holds Media Workshop

The Indonesia Biotechnology Information Center (IndoBic) organized a "Workshop for media: An effort to build positive perception toward application of biotechnology in Indonesia" in Bogor, Indonesia on June 14-15, 2006. Part of the Agricultural Biotechnology Support Project II (ABSP II) communication initiatives in the country, the workshop oriented 32 practitioners from the tri-media on local research initiatives, as well as perceptions, issues, and concerns about the technology. Newspaper writers, radio and television broadcasters participated in simple laboratory exercises, such as preparation of yogurt (classical biotech), and detection of hybrid DNA crops (modern biotech). A highlight of the workshop was a visit to IndoBic, ICABIOGARD, and the

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Clonal Propagation of Candidate PRSV-resistant Line

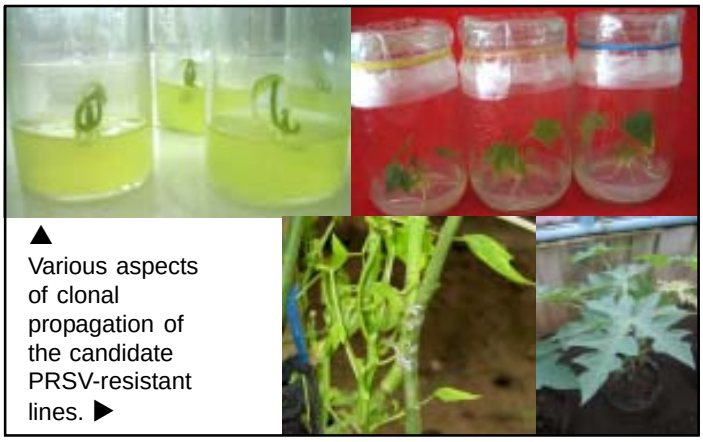
The Papaya Product Development Team is using two strategies to clone or duplicate the candidate Papaya ringspot virus (PRSV)-resistant lines of "Davao Solo."

Cloning will give the team a wider window to supply the other team members with more materials to be used for molecular analysis and virus efficacy screening. In addition, the clones kept in tissue culture in the laboratory will safeguard the precious bio-engineered papaya lines.

The three candidate PRSV-resistant T2 lines (or the third generation of the line) were cloned. These lines consisted of six progeny plants previously selected based on PCR analysis of the introduced transgene; efficacy against PRSV infection; and desirable phenotypic traits, such as fullness of column, sweet fruits, firm flesh, and freckle-free skin.

Actively growing shoots on the stem of the selected plant were produced for use as initial propagating material. This was done artificially by treating certain plant parts with gibberellic acid (GA3) and benzylaminopurine (BAP). These treatments were given to dormant, buds on the trunk or stem of papaya plants growing in the BL2 greenhouse at the Institute of Plant Breeding (IPB).

The tip of the shoot was transferred to De Fossard medium, an artificial medium that was fortified with the growth regulators naphthalene-acetic acid (NAA) and BAP. When the shoots developed 3-4 leaves, they were transferred to a medium containing indolebutyric acid (IBA), which would induce rooting. This treatment lasted for only three days, after which the plants were grown again in the De Fossard medium, this time without growth regulators.



▲ Various aspects of clonal propagation of the candidate PRSV-resistant lines. ▶

At present, several clonal plants of the candidate lines are rooting in tissue culture, and are ready for planting in soil.

Another cloning strategy is inarching. Portions of the stem of both the actively growing shoot and the young seedling were scraped or removed, and then joined with a piece of straw to keep the stems strongly united for two months. The inarched shoot was then severed from the mother plant.

Vigorously growing inarched plants of the candidate lines are now ready for use as sources of tissues for molecular analysis and virus efficacy testing. These activities are being undertaken to comply with local regulatory requiremenets prior to a limited field trial.

Host Range of EFSB Identified

The alternate host plants of eggplant fruit and shoot borer (EFSB), *Leucinodes orbonalis* Guenee, were determined by force feeding borers with eggplant, white potato, sweet potato, tomato, okra, pole sitao, or black nightshade. The EFSB were force-fed with pods, fruits, or tubers of the seven crops until the borers died.

Results of the study showed that the EFSB was able to successfully complete its life cycle when fed with eggplant, black nightshade, and white potato. With tomato and pole sitao, larval development was completed, but the resulting pupae were abnormal. EFSB larvae were able to survive for only two days and 12 hours on sweet potato and okra, respectively. There was no significant difference in the longevity of the adult moths reared on eggplant and black nightshade, but their life spans were significantly longer than of those moths recovered from white potato.

The weights of the sixth instar larvae continuously reared on the aforementioned crops did not differ significantly, although the weights of the larvae can be ranked as follows: eggplant > black nightshade > white potato. The 6th instar larvae fed with tomato and pole sitao were lighter, with those reared on tomato slightly heavier than those fed with pole sitao. Unmated females produced sterile eggs. The larvae reared on tomato and pole sitao also had dark body pigmentation, while those larvae reared on eggplant, black nightshade, and white potato had lighter coloration.

In terms of suitability both as food and developmental host, the black nightshade could serve as alternate host for the eggplant fruit and shoot borer. On the other hand, pole sitao and tomato could be utilized by the EFSB larvae as alternate food plants.

EFSB Ovipositional Behavior Investigated

The ovipositional, or egg-laying behavior of eggplant fruit and shoot borer (EFSB) was investigated among nine varieties of eggplant, namely Balbalusa, Bilog-Pangasinan, Bilog-San Roque, Casino, Concepcion, Dumaguete Long Purple, Kirit, Mara, and Mistisa. The morphological characters of the varieties that may possibly influence the choice for oviposition by the female moth of EFSB were examined. These characters were trichome length and density; color of the stem, petiole, leaf and calyx; leaf blade tip shape and lobing; tightness of the calyx; presence of spine; and fruit shape and color.

It was observed that female EFSB, which is active during the night, transferred randomly from one plant to another as part of its egg-laying. The upper and middle leaves were most preferred over lower leaves. Eggs are laid on the veinlets of the leaf undersurface either singly or in groups of 2-4. The preference of the EFSB for oviposition in decreasing order is as follows: Bilog-San Roque > Mara > Dumaguete Long Purple > Balbalusa=Bilog-Pangasinan > Mistisa=Casino=Kirit > Concepcion.

Among those characters examined, the varieties differed significantly only in terms of trichome density, and have significant influence on the number of eggs laid. The result implies that the EFSB is attracted to oviposit on varieties with denser leaf trichomes.

Synthesis of Biotech Perception in Indo and Philippines

Two synthesis reports of research information on perceptions about biotechnology in Indonesia and the Philippines were recently completed. This involved gathering and analyzing data from various perception studies conducted in the two countries. The reports answered the questions: What do people think about science and biotechnology? How much do people know about biotechnology? What is the people's attitude toward biotechnology? What information do they want, and how do they want it?

Some insights of "What Indonesians think, feel and know about biotechnology: A synthesis of research information of public perceptions on biotechnology in Indonesia" reveal that Indonesians in general:

- Believe that benefits of biotechnology outweigh its risks, and that it can be highly or moderately beneficial. They have a moderate interest, concern, and attitude about biotechnology, and think that moral and ethical issues would influence their judgments about it, followed by cultural considerations. Bases for judging biotechnology in their respective professional tasks involve a balancing of benefits of biotechnology applications and its impact on biodiversity and the environment.
- Get information on biotechnology from the mass media and from interpersonal sources, some stakeholder groups much more frequently than others. Trusted sources are university scientists, science magazines, and newspapers. They have faith in what science and biotechnology can do for them, but are deficient in information and in-depth knowledge about it.
- Are highly concerned about the food they eat, primarily with food contents such as nutritional value. They anticipate benefits from biotechnology, citing improved eating quality as the most expected benefit. The public is more concerned about price rather than its transgenic source. However, they are cautious about food derived from transgenic products.

Insights from "Biotechnology in the eyes of the Filipino: A synthesis of researches on public perceptions of biotechnology" suggest that Filipinos in general:

- Are predisposed to a favorable attitude toward biotechnology. Undesirable experiences and unrealized expectations about biotechnology can swing that predisposition to the unfavorable side.
- Are open-minded about biotechnology, despite minimal understanding. There is low knowledge among different stakeholder groups, but they express interest and willingness to learn about biotechnology, primarily its importance and use. Communication materials on biotechnology have improved the knowledge, understanding, and attitude of target stakeholders substantially.
- Are not getting enough information about biotechnology such that it has not become an issue that people would be motivated to talk about.

Synthesis of opinion studies show similarity in results of the country surveys conducted in both countries. Basically, respondents have a favorable attitude toward biotech and hence must be capitalized to sustain a positive environment for the technology.

Progress of Agrobacterium-mediated transformation for LBR Potato in Indonesia

Putative transformed Granola shoots in rooting media, ICABIOGRAD

The Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development (ICABIOGRAD) is continuing Agrobacterium-mediated transformation of Granola potato cultivars using the RB gene construct from the University of Wisconsin. Of all transformed explants, 95 formed shoots, and were thus transferred to rooting media. Acclimatization of putative transformed shoots and PCR analysis will be conducted in July 2006. The ICABIOGRAD will also conduct new transformation of Agrobacterium tumefaciens LBA 4404 with plasmid CLD 04541, containing the RB gene, during the same time period.

Successful crosses using transgenic Katahdin SP951

Top: Berries formed in the crossing of Granola x Katahdin SP951 at IVEGRI. Bottom: Berries formed in the crossing of Atlantic x Katahdin SP904 at ICABIOGRAD.

The Indonesian Vegetable Research Institute (IVEGRI) hybridized potato varieties Granola and Atlantic with the transgenic Katahdin SP951. This resulted in the production of 23 berries on Granola and 19 berries on Atlantic. The hybridization was conducted toward the end of June 2006, since flowering of the transgenic Katahdin SP904 began late. Formation of the berries is still in progress.

The Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development (ICABIOGRAD) also carried out hybridization activities at its biosafety containment facilities in Bogor, Indonesia. Hybridization between Granola and the transgenic Katahdin SP904 produced two berries. On the other hand, six berries were formed in the hybridization between Atlantic and the transgenic Katahdin SP904.

Indonesia Holds Media Workshop (From page 1)

Biotechnology Research Institute (LIPI - Cibinong). Participants were able to see confined field trials of transgenic crops, and laboratories where research on biotech crops was being conducted.

The participants of the workshop recommended that their group be included in the IndoBIC mailing list to enable them to attend meetings organized by the BIC. As a result of the workshop, several articles on crop biotechnology were written and published in various newspapers such as Radar Bogor, Media Indonesia, Republika, and Pakuan Raya, as well as for television.

ABSP II Scientists Visit ICABIOGRAD, IVEGRI

Drs. Nurul Alam (Executive Chairman of Bangladesh Agricultural Research Council and Board Member of ABSPII) and GP Das (ABSPII country coordinator for Bangladesh), and Drs. Desiree Hautea (ABSPII Regional Coordinator for SE Asia) and Claudia Canales (molecular biologist and communication expert from ISAAA) visited the Indonesian Vegetable Research Institute (IVEGRI) and the Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development (ICABIOGRAD) from June 5-8, 2006.

The guests met with Dr. KR Sutrisno, director of ICABIOGRAD, on the first day of their visit. They also met the LBR Potato team; MVR Tomato team; Dr. Karden Mulya, head of ICABIOGRAD's Research Collaboration and Publication Division; and Ms. Widiati Adil, head of the Collaboration Section. The research teams presented the progress of their activities. After the meeting, the guests visited the center's laboratory and biosafety containment facilities.

The guests visited IVEGRI, in Lembang, on the afternoon of June 5. They met with Dr. Eri Sofiari, director of IVEGRI; and Drs. Atie Duriat, a virologist, and Euis, a mycologist. They also visited IVEGRI's greenhouse and laboratories.

Drs. Nurul Alam and GP Das met with Dr. Widi Harjono, head of research collaboration and public relations of the Indonesian Agency of Agricultural Research and Development (IAARD), on June 7 in Jakarta. On June 8, discussions were conducted amongst Drs. Claudia Canales, Bambang Purwantara (INDOBIC), Tantono Subagyo, and Amy Estiati of the Indonesian Institute of Sciences (LIPI) on the planning of the ABSPII risk communication workshop.

Dr. Desiree M. Hautea, Edy Listanto, Dr. GP Das, Eri Sofiari, Nurul Alam, and Mrs. Alam in IVEGRI, Lembang visiting results of crossing work between Bangladesh's materials and Katahdin

Philippine Regulatory Agency Approves Contained Testing of MVR Tomato

The contained testing of multiple virus resistant (MVR) tomato was finally approved by the National Committee on Biosafety of the Philippines (NCBP) during its monthly meeting on May 31, 2006. The approval comes one year after the project proposal was first filed, and after three revisions and resubmissions.

The delay in the regulation has caused a year's setback in the project's implementation, particularly in its transgenic technology component. Nonetheless, the setback enabled research personnel to be more thorough and careful in consolidating and assessing primary and secondary data for the bio-safety conduct of the MVR tomato project, as well as in addressing likely concerns in the future when the variety will be deployed in the field.

The permit to import seeds of the transgenic tomato materials has already been filed with the Department of Agriculture-Bureau of Plant Industry. The requested seeds include the initial crosses produced during the research internship training of Dr. Melquiades E. C. Reyes at the Asian Vegetable Research and Development Center (AVRDC), and the transgenic CMV-resistant tomato (parental) lines. Initial crosses have already been made between AVRDC's CMV-CP tomatoes and selected Philippine varieties Super Apollo, Rica, and IPB1403. As per procedural processing, the permit is expected to be issued within the first week of July 2006. The AVRDC, through Dr. Peter Hanson, is also preparing the applicable documents, such as the Phytosanitary Certificate for the shipment of the requested tomato seeds. The material transfer agreement for these tomato materials was signed between the University of the Philippines, Los Banos (UPLB) and AVRDC during the project coordination and planning meeting held January 10, 2006.

The transgenic tomato materials will be used for efficacy testing and marker-assisted breeding under BL2 greenhouse conditions at the Institute of Plant Breeding (IPB), UPLB in order to develop an MVR tomato variety for the Philippines.

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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