

## **Development of bacterial blight resistant Mestizo hybrid maintainer and restorer lines through marker-aided backcrossing**

Lucia M. Borines<sup>1</sup>, Emilie O. Espejo<sup>1</sup>, Robelyn T. Piamonte<sup>1</sup>,  
Casiana M. Vera Cruz<sup>2</sup> and Edilberto Redoña<sup>2</sup>

<sup>1</sup>*Dept. of Pest Management, VSU, Visca, Baybay, Leyte Philippines and*

<sup>2</sup>*International Rice Research Institute, DAPO BOX 7777, Metro Manila Philippines*

### **ABSTRACT**

This study was conducted to: 1) evaluate the reaction of Mestizo hybrids, their maintainer and restorer lines to Philippine *Xanthomonas oryzae* pv. *oryzae* races, 2) incorporate bacterial blight resistance genes to these lines via marker-aided backcrossing and 3) confirm the presence of introgressed *Xa* genes in the progeny of each backcross generation through phenotyping and molecular marker analysis.

Mestizo hybrids, their maintainer and restorer lines, IRBB62 donor, and checks were inoculated with ten *Xoo* races (12 isolates). Marker-aided backcrossing from IRBB62 donor (with *Xa4/7/21*) to each line was done to introgress target genes. The resistance genes in the advanced lines were confirmed using diagnostic *Xoo* races and analyses of linked DNA markers.

Mestizo 1,2 and 3, their maintainer and restorer lines (IR68888B, IR68897B, IR34686R, IR62161R, IR60819R) except IR58025B were similar to IRBB4 indicating the presence of *Xa4* resistance gene in these lines. All the lines however, did not contain the *Xa7* and *Xa21* genes. Resistance genes *Xa7* and *Xa21* were incorporated in addition to *Xa4* to BC<sub>5</sub>F<sub>2</sub> progeny (BC<sub>5</sub>F<sub>3</sub> seeds) of IR34686-179-1-2-1R, IR60819-34-2R, IR62161-184-3-1-3-2R and IR6888B. Resistance genes were also incorporated to BC<sub>4</sub>F<sub>1</sub> progeny (BC<sub>4</sub>F<sub>2</sub> seeds) of IR58025B and IR68897B. The presence of the genes was confirmed through linked markers.

The lines containing gene pyramids had increased resistance to bacterial blight and a wider resistance spectrum to *Xoo* races. Advanced backcross progeny were phenotypically similar to their recurrent B and R lines.

Keywords: rice, hybrid, maintainers, restorers, resistance