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IMPROVING RICE LINE Ld 99-12-38 FOR BACTERIAL LEAF BLIGHT RESISTANCE THROUGH MARKER ASSISTED SELECTION (MAS)

Bacterial leaf blight (BLB) caused by *Xanthomonas oryzae* pv. *oryzae* is an emerging issue in rice cultivation. There are no chemicals used effectively as a control method in the world. Use of resistant varieties is the most appropriate mode of control. Dominant genes Xa21 and Xa4 are known to convey durable resistance against BLB. The advanced rice line, Ld 99-12-38 is a farmer demanding, high-yielding rice line, and is susceptible to BLB. In the current study, an attempt was made to improve its resistance to BLB through marker-assisted breeding (MAB). Through MAB of Ld 99-12-38/ IRBB 60 the resistance alleles coming from the IRBB 60 were introgressed into the Ld 99-12-38 and progeny lines were advanced up to BC3F6. Two linked-markers, pTA248 (Xa21) and PM1+MP2 (Xa4) were assayed on the thirty-five BC3F2 progeny to evaluate resistance allele diversity of Xa21 and Xa4. Selected four progenies in BC3F6 were evaluated in yield trial. Out of the tested 35 progeny lines, eight were confirmed phenotypically as resistant for both Xa21 and Xa4, they carried the resistance alleles, twenty-one carried only the resistant allele at Xa4, however, they were phenotypically categorized as resistant/moderately resistant. A paired t-test revealed that there is a significant difference in the resistance level exerted by progeny carrying resistance alleles of two rather than with one ($p = 0.0064$). Selected four lines with Xa 21 and Xa 4 performed well with significant yield advantage compared to Ld 99-12-38. Therefore, it can be concluded that resistant alleles of Xa21 and Xa4 have been successfully introgressed into rice lines derived from a cross between Ld 99-12-38/IRBB 60 with desirable morphological characters of Ld 99-12-38 to withstand BLB.

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Sri Lanka

Author: Mrs WEERASINGHE, Deepika (Regional Rice Research and Development Center, Bombuwela)

Co-authors: Mrs AMARATHUNGA, Akila (Regional Rice Research and Development Center, Bombuwela, Sri Lanka); Mr WITHANAWASAM, Darsha (Regional Rice Research and Development Center, Bombuwela Sri Lanka); Dr JAYATILAKE, Dimanthi (University of Peradeniya, Faculty of Agriculture, Sri Lanka); Dr UDAWELA, Kapikasiri (Rice Research Institute, Batalagoda, Sri Lanka); Mrs GUNASINGHE, Mihirini (Regional Rice Research and Development Center, Bombuwela, Sri Lanka); Mrs DE SILVA, Pradeepa (Regional Rice Research and Development Center, Bombuwela, Sri Lanka)

Presenter: Mrs WEERASINGHE, Deepika (Regional Rice Research and Development Center, Bombuwela)

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