

Category	: International Rice Research Conference
Select Theme	: Genetic improvement
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Keyword 1	: Breeding for future markets/novel products
Keyword 2	: Marker-assisted selection
Keyword 3	: Biotic stress tolerance
Title of Entry	: Development of high yielding and BLB resistant Basmati Elite Lines to boost in export of high quality rice in international markets
Presenting author	: Dr. Muhammad Bashir Cheema , Principal Rice Breeder
Presenting author email	: mbashircheema@hotmail.com
Co author 1	: Kashaf Ali Shah, Rice Breeder
Co author 2	:
Affiliation presenting author	: Emkay Agricultural Research Center, Farooqabad, District Sheikhpura, Pakistan
Affiliation 1	: Emkay Agricultural Research Center, Farooqabad, District Sheikhpura, Pakistan
Affiliation 2	:
Select only one type of presentation	: 15 minute oral presentation
Abstract	: Pakistan has an export protentional of Basmati rice about 4 billion US\$ but hardly touching one billion mark. Bacterial Leaf Blight (BLB) caused by <i>Xanthomonas oryzae</i> pv. <i>oryzae</i> is a major disease of Basmati rice in Pakistan. Basmati rice is famous in the world for it's unique taste, aroma and excellent cooking qualities. But it badly affects the yield and quality of rice. Current Basmati varieties of Punjab, Pakistan are susceptible and highly susceptible to BLB disease. Fungicides, Topsin, Score, Copper Oxychloride and Copper based treatment do not control this disease. Development and use of resistant varieties is an economical and enviroment friendly way to control BLB in rice. So far, Basmati 385, Supper Basmati and RP 22 were crossed with IRBB57. Marker assisted back crossing was used until Bc4 generation to transfer BLB resistant genes from donor to recurrent parents. Selected Bc3 F1 and Bc4 F1 plants were selfed to produce homozygous Basmati elite lines of different BLB resistant gene combinations. Forty-five Basmati elite lines of different morphological characters were shown phenotypic resistance to BLB disease in an epidemic condition. But only six lines were out yielded the check varieties Super Basmati, Basmati 385 and RP 22 in a replicated yield trial during 2017. Aroma, taste, milling and cooking qualities of these lines are at par to recurrent parents. Molecular markers of genes of interest were used to identify the genes that govern BLB resistance in these elite lines. They proved that these lines contained Xa.4+Xa.21, Xa.5+Xa.21 and Xa4+Xa.5+Xa.21 gene combinations in their genomic DNA. In this study, it is also found that gene Xa.4 and Xa.5 alone do not show resistance to BLB disease but slightly perform better when they are in combination of Xa4 + Xa.5. The gene Xa.21 alone and in different combination shows durable resistance to

current BLB pathotypes in our climatic conditions. Three Basmati elite lines of diversified morphological characters will be ready for testing in National Uniform Yield Trials in 2019.

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