

SHORT COMMUNICATION

DRR Dhan 53 (RP-6113-Patho-BB9; IET 27294) - a high yielding, bacterial blight resistant, fine grain type rice variety

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Abstract

DRR Dhan 53 was released for commercial cultivation in Samba Mahsuri/Improved Samba Mahsuri growing regions of Telangana, Andhra Pradesh, Tamilnadu, Karnataka, Chhattisgarh, Orissa, Jharkhand, Bihar, Gujarat and Maharashtra by Central Sub-committee on Crop Standards, Notification and Release of Varieties in 2020. It is a cross between Improved Samba Mahsuri*3/PAU 3554. DRR Dhan 53 (IET 27294) is a marker assisted selection (MAS) derived product in the genetic background of Improved Samba Mahsuri. DRR Dhan 53 is a durable bacterial blight resistant, high-yielding, fine-grain type rice variety having the major bacterial blight resistance genes, Xa21+xa13+xa5+Xa38 with seed to seed maturity of 130-135 days and average yield of 5.5- 6 t/ ha.

Keywords: Xa 38, bacterial blight, medium slender, grain yield

Bacterial blight (BB) of rice caused by Xanthomonas oryzae pv. oryzae is one of the major production constraint especially in irrigated and rainfed lowland ecosystem in India. It is primarily a disease of monsoon season, of high yielding rice varieties grown under heavy nitrogen fertilization. Yield loss due to the disease may be as high as 50% or more depending on the variety, growth stage, extent of nitrogenous fertilizers applied, geographical location and seasonal conditions. Analyses of survey data of last 40 years has revealed that the disease has increased significantly in different rice growing regions of India. In last one decade, bacterial blight has appeared in epidemic proportion in several parts of South India causing significant yield loss in fine grain rice varieties like Samba Mahsuri (Laha et al., 2016). As chemical control of the disease is not satisfactory, development and deployment of bacterial blight resistant rice varieties is the most important method of managing

the disease. Even though, the rice variety, Improved Samba Mahsuri (possessing three bacterial blight resistance genes, *Xa21*, *xa13* and *xa5*) has shown good level of resistance against bacterial blight, at few locations it has shown only moderate resistance indicating evolution of new virulence forms of the pathogen. Therefore, DRR Dhan 53 was developed by adding a new gene, *Xa38* in the genetic background of Improved Samba Mahsuri to provide a higher level and broad spectrum resistance against bacterial blight of rice.

Parentage

It is a cross between Improved Samba Mahsuri*3/PAU 3554. DRR Dhan 53 (IET 27294) is a MAS derived product in the genetic background of Improved Samba Mahsuri. An additional '*Xa38*', a dominant, broad-spectrum bacterial blight resistant gene from the donor parent, PAU 3554 [PR 114 (Xa38)], is



introgressed into bacteial blight resistant rice variety, Improved Samba Mahsuri through marker assisted backcross breeding (Yugander *et al.*, 2018).

Characteristics of DRR Dhan 53

- DRR Dhan 53 is a MAS derived, durable bacterial blight resistant high-yielding, fine-grain type rice variety having the major bacterial blight resistance genes, Xa21+xa13+xa5+Xa38 with seed to seed maturity of 130-135 days and average yield of 5.5-6 t/ ha.
- DRR Dhan 53 possesses medium-slender grain type with very good HRR (78.7%), intermediate amylose content (22.2), optimum GC (22) and intermediate ASV (5.0) and is comparable to the



Considering on par or better performance for yield, grain and cooking quality traits with the recurrent parent and added advantage of its resistance to bacterial blight, DRR Dhan 53 was released for commercial cultivation in Samba Mahsuri/Improved Samba Mahsuri growing regions of Telangana, Andhra Pradesh, Tamilnadu, Karnataka, Chhattisgarh, Orissa, Jharkhand, Bihar, Gujarat and Maharashtra by Central Sub-committee on Crop Standards, Notification and Release of Varieties in 2020.

References

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recurrent parent, Improved Samba Mahsuri in all the grain and cooking quality parameters.

- The variety exhibited highly resistant reaction to bacterial blight at different bacterial blight hot spot locations in India. In AICRIP trials, it exhibited an SI of 4.2 (2018) and 3.5 (2019) as compared to the recurrent parent, Improved Samba Mahsuri which showed SI of 4.6 (2018) and 3.9 (2018).
- In AICRIP trial, it recorded average yield advantage of more than 7% over the recurrent parent, Improved Samba Mahsuri.
- Based on background analysis, it has shown > 93 % recovery of recurrent parent genome and complete phenome recovery of the recurrent parent, Improved Samba Mahsuri.



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