

Screening of rice genotypes against brown spot disease (*Bipolaris oryzae*) in the sub-tropical region of Bihar

VISHALKUMAR, UDAY KUMAR AND AMARENDRA KUMAR*

Deptt. of Plant Pathology, Bihar Agril. Univ., Sabour, Bhagalpur, Bihar, India-813210

*Corresponding Author E-mail: kumaramar05@gmail.com

Abstract

Rice (*Oryza sativa* L.) is the staple food for over two billion people, predominantly in rural and urban areas of tropical and subtropical Asia. However, rice crops are highly susceptible to various diseases caused by fungal, bacterial, and viral pathogens. Among these, brown spot disease, caused by *Bipolaris oryzae* (*Cochliobolus miyabeanus*), is a widespread and chronic issue that significantly reduces yields globally. Identifying resistant genotypes is an essential and ongoing effort to recommend suitable varieties for cultivation in disease-prone areas or to use them as donors of resistance genes in breeding programs. In this context, a study was conducted during the Kharif season of 2023-24 at the Research Farm of Bihar Agricultural University, Sabour, to evaluate 639 rice genotypes (National Screening Nursery 2 segment) for their response to brown spot disease. The study revealed that none of the genotypes were immune to the disease (0 % severity). However, 23 genotypes, including CR 4396-1-13-11, CSR AP10, YNPK-7258, HURS-23-16-IR 143511-78-2-2 963-50-18, CR 4396-97-2-4, R 1672-126-1-24-1, RP 6680-RMS-3-5-9-16, NPT 1059-9, RP 6533-RMS-9-21-33-45, RP 6758-RMS 75-19-81-45, MLD 216-IR16T1437, CR 4203-225-2, KAU PTB-mut-46-1-1-2-1, Pusa 5377-4-1-1-2-2-1, RP 6427-db-111, Gurmatiya sel.1, MCM 138, CSR 2018-43-16, CSR 2018-43-37, CSR 10, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001 and KR 21001 demonstrated resistance with a disease severity of only 1%. Additionally, 170 genotypes were categorized as moderately resistant, 186 as moderately susceptible, 184 as susceptible, and 76 as highly susceptible. These findings provide valuable insights into resistant genotypes that can be leveraged in breeding programs to reduce the impact of brown spot disease on rice production.

Key Words: Rice, genotype, screening, brown spot disease

Introduction

Rice is one of the most important food crops globally, serving as the staple diet for approximately 2.7 billion people. It is the primary food source for over 60% of the world's population. By 2050, the global population is projected to reach 4.6 billion, significantly increasing the demand for food grains. Meeting this demand will require a consistent rise in production over the coming years (Khush, 1996). However, rice production faces numerous challenges, including the reliance on traditional farming practices such as manual weeding, soil preparation, inadequate plant-spacing practices that lead to high seeding rates, and water scarcity. In Bihar, rice is predominantly

cultivated as a monocrop during the *kharif* season, covering about 60% of the cultivated area in the state (Kumar *et al.*, 2020). The crop is highly susceptible to several fungal diseases, which can cause moderate to severe yield losses. One such disease is brown spot (BS), caused by *Bipolaris oryzae* (teleomorph: *Cochliobolus miyabeanus*), a serious seed-borne and seed-transmitted disease of rice worldwide (Mew and Gonzales, 2002). The first recorded outbreak of *H. oryzae* occurred in Bengal, India, in 1942-43, where it devastated 50-90% of the rice crop, leading to a famine in which two million people died of starvation (Padmanabhan, 1973).

In the year 2022-23, India cultivated rice across 47.83 million hectares land with production and productivity of 135.76 million tonnes and 28.38 quintals per hectare, respectively. Its cultivation occupies approximately 25% of the country's agricultural land, establishing India as the second-largest rice producer globally, after China. This crop constitutes over 30% of the total cropped area and more than 40% of the nation's food grains. Additionally, rice farming provides livelihoods for 70% of the population. It is grown throughout all Indian states, with West Bengal, Uttar Pradesh, and Punjab being the top producers. Bihar ranks as the seventh-largest producer, contributing 7.02 million tonnes with a productivity rate of 24.53 quintals per hectare (Agricultural Statistics at a Glance, 2023).

Rice production is significantly affected by various biotic and abiotic factors, leading to reduced productivity. Among the biotic factors, rice is particularly susceptible to several diseases caused by fungi, bacteria, viruses, and nematodes. Major fungal diseases include blast (*Pyricularia oryzae*), brown leaf spot (*Bipolaris oryzae*/*Helminthosporium oryzae*), stem rot (*Sclerotium oryzae*), sheath blight (*Rhizoctonia solani*), and sheath rot (*Sarocladium oryzae*). Bacterial diseases such as bacterial blight (*Xanthomonas oryzae pv. oryzae*), viral infections like rice tungro virus, and nematode diseases such as rice root knot (*Meloidogyne graminicola*) are also significant challenges. Among these, blast and brown spot diseases are particularly noteworthy due to their economic impact. Brown spot disease was first reported in India in 1918 in the Thanjavur delta of South India by McRae (1922). It gained widespread attention following a severe epidemic in 1919 (Padmanabhan, 1965). These historical outbreaks highlight the importance of managing such diseases to ensure sustainable rice production.

The pathogen attacks rice from the seedling stage to the milk stage. Symptoms of brown spot first appear in young seedlings as small blighted areas, and later affect the coleoptile, leaf blade, leaf sheath, and glumes, with the most prominent symptoms observed on the leaf blades and glumes. On leaves, typical lesions are brown with a grey or whitish center, cylindrical or oval in shape, resembling sesame seeds.

Young spots are small, circular, and may appear as dark brown or purplish dots, often surrounded by a yellow halo. As the disease progresses, several spots may coalesce, causing the leaves to dry out. The severity of the disease increases under stress conditions, leading to seed discoloration, reduced seedling vigour, and significant yield loss.

In India, brown spot occurs annually on most cultivated rice varieties. Affected nurseries can often be identified from a distance by their scorched appearance due to seedling death, and the disease can drastically reduce grain weight and overall yield (Agarwal et al., 1989). Yield losses ranging from 6% to 90% have been reported as a result of this disease (Prabhu and Vieira, 1989). Kamal and Mia (2009) observed yield reductions of 18.75% to 22.50%, while other studies reported losses of 26% to 52% (Chakrabarti, 2001). Kumar et al. (2020) also reported a maximum disease incidence of 31.39% and disease severity of 46.60%. Brown spot is a major constraint on rice production in the Bihar region. Given the economic significance of this disease, a systematic study is necessary to assess the prevalence of brown spot in the subtropical region of Bihar. Cultivating resistant genotypes is an effective and cost-efficient approach to managing diseases compared to chemical control methods. Therefore, it is essential to screen multiple genotypes to identify those with resistance. In this context, the present study was conducted during the *Kharif* season of 2023-24 at the Research Farm of Bihar Agricultural University, Sabour to evaluate rice genotypes against brown spot diseases under field conditions.

Methods and Materials

Under field condition evaluation of genotypes against B. oryzae

A field experiment was conducted during *Kharif* 2023-24 at Research farm, Bihar Agricultural College, Sabour which is located on the broad Indo-Gangetic plain of North India at longitude 87.04° East and latitude 25.24° North, at an altitude of 46 meters above mean sea level. Sabour is located in III A agro-climatic zone of Bihar. The experimental area is irrigated medium with loam soil. Field preparation, planking, and other necessary operations were carried out using tractor-drawn

implements. Agronomical practices done by following the technical guidelines of AICRP rice. The crop was fertilized with the recommended doses of NPK (100:60:40) and zinc sulfate (20 kg/ha) at appropriate stages. Weeding also performed at the proper times to ensure optimal crop management.

One lines of each genotype having 3.5 m length was transplanted using an Augmented Design at the Bihar Agricultural University research farm during the *Kharif* seasons of 2023-24.

Observation

Twenty-five randomly selected leaves were collected from each line at 15 days before harvesting and their disease scoring was done by using 0-9 disease scoring scale according to “Phytopathometry” by Mayee and Datar (1986). Percent disease index was evaluated using a 0-9 scale and calculated according to the formula given by Wheeler (1969).

$$\text{Percent Disease Index (PDI)} = \frac{\text{Sum of all individual disease ratings}}{\text{Total No. of leaves observed} \times \text{Maximum disease grade}} \times 100$$

Table 1: Disease scoring scale of brown spot of rice (Mayee and Datar 1986)

Disease score	Disease Severity (% of leaf area diseased)	Disease Reaction
0	No incidence	Immune
1	Less than 1 %	Resistant (R)
3	1 – 10 %	Moderately resistant (MR)
5	11 – 25 %	Moderately susceptible (MS)
7	26 – 50 %	Susceptible (S)
9	More than 50 %	Highly Susceptible (HS)

Table 2: Frequency of National Screening Nursery 2 genotypes showing different disease reaction against Brown spot disease of rice during *Kharif* 2023-24.

Disease score	Disease Severity (% of leaf area diseased)	Disease Reaction	No. of genotypes	Frequency (%)
0	No incidence	Immune	0	0.00
1	Less than 1 %	Resistant (R)	23	3.60
3	1 – 10 %	Moderately resistant (MR)	170	26.60
5	11 – 25 %	Moderately susceptible (MS)	186	29.11
7	26 – 50 %	Susceptible (S)	184	28.79
9	> 50 %	Highly Susceptible (HS)	76	11.89

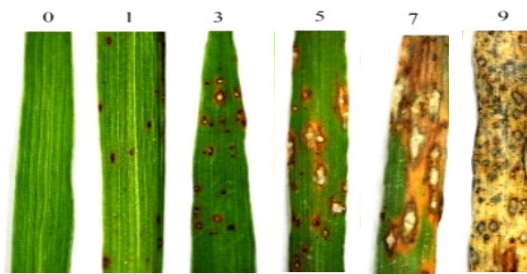


Plate 1: Pictorial scale for scaling brown spot of rice.

Results and Discussion

In order to identify the resistant sources, 639 rice genotypes were screened by using 0-9 scale against brown leaf spot disease under natural epiphytotic condition. The genotypes were grouped into six classes based on degree of reaction and the number of genotypes falling in particular group and results are presented in Table 2 &3 and graph 1.

Out of 639 genotypes in National Screening Nursery 2 segment, none of the entry was found immune with disease severity 0 %. Whereas, only 23 genotype *i.e.*, CR 4396-1-13-11, CSR AP10, YNPK-7258, HURS-23-16-IR 143511-78-2-2 963-50-18, CR 4396-97-2-4, R 1672-126-1-24-1, RP 6680-RMS-3-5-9-16, NPT 1059-9, RP 6533-RMS-9-21-33-45, RP 6758-RMS 75-19-81-45, MLD 216-IR16T1437, CR 4203-225-2, KAU PTB-mut-46-1-1-2-1, Pusa 5377-4-1-1-2-2-1, RP 6427-db-111, Gurmatiya sel.1, MCM 138, CSR 2018-43-16, CSR 2018-43-37, CSR 10, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001 and KR

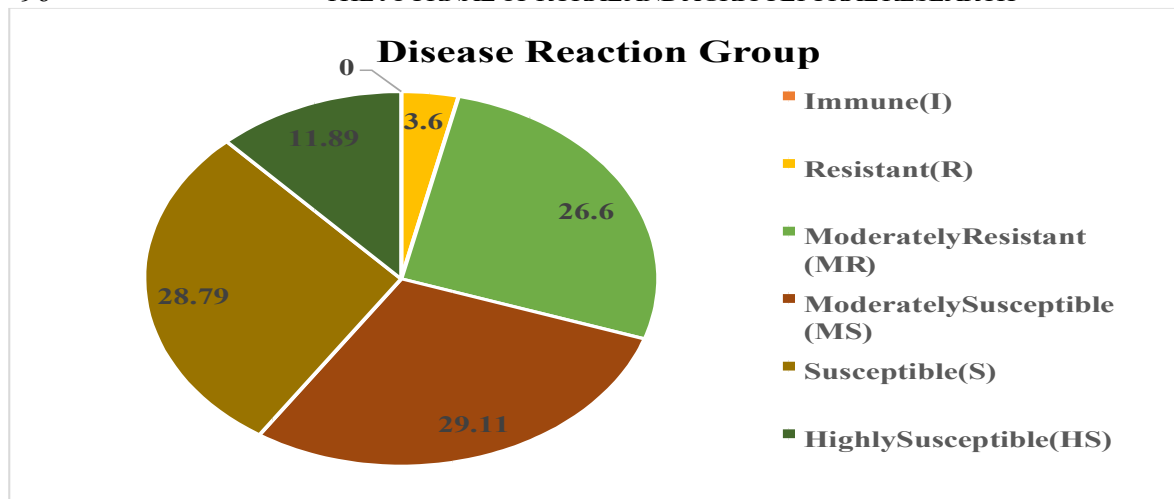


Fig. 1: Frequency of National Screening Nursery 2 genotypes showing different disease reaction against Brown spot disease of rice during *Kharif* 2023-24

Table 3: Grouping of rice genotypes (National Screening Nursery 2) based on their reaction against brown spot disease under field condition during *Kharif*-2023-24

Rating Scale	Genotype
0 (Immune)	-
1 (Resistance)	CSRAP10, YNPK-7258, HURS-23-16-IR 143511-78-2-2-963-50-18, CR 4396-97-2-4, R 1672-126-1-24-1, RP 6680-RMS-3-5-9-16, NPT 1059-9, RP 6533-RMS-9-21-33-45, RP 6758-RMS 75-19-81-45, MLD 216-IR16T1437, CR 4203-225-2, KAUP TB-mut-46-1-1-2-1, Pusa 5377-4-1-1-2-2-1, RP 6427-db-111, Gurmatiya sel.1, MCM 138, CSR 2018-43-16, CSR 2018-43-37, CSR 10, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001 and KR 21001,.
3 (Moderately Resistance)	Samba Early, CRAC 3998-325-3, RP 6767-CGR 25-CGIL-70 CGK2-1-2131-21, BRR 2135, RP 6449-db-235, KPS 10375, TRC 2023-26/ TRC SMTC 5488 B-B-11-41, BPT 5204, NDR 2022-1-2, NWGR 17121, RNR 38123, WGL 1724, NVSR 991, RP 6769-1144-12-1-2-1-2, Improved Samba Mahsuri, RP 6770-960-22-10-3-1, CB 18920, HTW 101-IR16A2106, BRR 2278, RP Bio 4919-NSR 96, IIRRH-175, ADVRH 200070, NVSR 1141, CR 4457-IR 129477-4026-249-15 1-4, TRC 2023-3/ TRC H2N 5421-B-B-3-7, RP 6615-MK/RIL-FBMI-28-21-2, CB HTR 22001, CR 3426-225-65-11, RCPL-1-443, RP 6761-MSAC 26-IR144575-61 2-1-1-B, BRR 2274, ODR-1-2-18-2, RP 6460-C3-313, CR 4471-1-3-1-5-6, RCPR 100-IR83929-B-B-291-3-1-1, DRR Dhan 54, CRHR 189, NWGR-18096, IR 136734-53-1-1-1-1, PAU-IR 129477-709-375-3-5-7, JDP 5925, RP 6759-CGR19-CGIL-68-CGK 2-1-2131-68-2, CR 4073-1339-2-3-4-5, RNR 28361, BKR 542, RP 6238-RV/RIL-RV 132-1-1, CRHR 188, CR Dhan 202, PAU-IR 129477-1629-210-4-4-4, RP 6744-JBSM 3-3-1, IR 18A1711, RP 6762-MSAC 16-24, CR 4207-288-11-1, NVSR 3674, IIABR-15/IIAB-304/IR12A223, CR 4399-4393-A13-16-N7-4, PA 6129, CR 4459-3-1-1-1-1, TRC 2023-2/ TRC TJN5806-B-B-3-11, RP 6763-CGR 28-IR144572-20-4 1-1-B, KMP 256, R 2341-252-2-165-1, HURS-23-3-IR18A1658, RNR 37982, CR 4474-1-1-3-1-1-1, RP 5976-26-30-12-16, CSR 2021-DSR-29-4-194, R 2773-C-8-1-1, CR-4460-8-1-1-1-1, IR-14F-717, DRR H-4, IIRRH-176, HURS-23-13-IR18A1776, CR 4399-4393-A13-7-N4-4, CSR 2021-DSR-2-94-134, RP 6238-RV/RIL-RV 14, RP 6529-RMS-88-1-2-4, HURS 22-6, BKR 405, R 2449-1032-1-462-1, JKOJM-300-158-11, Alsakar Mutant 19, JR 14, OR 2594-5, Shobini (NC), CR 4448-2, JKOJM-300-584-5, Narendra Juhi Bengal, ORB-3GM-4, Badshabhog Sel.1, AAU-KMJ DHAN-47, KAUP TB-TRV-EBC-14, BRR-0215, Dubraj Sel. 1, ORB-1-BM-1, CR 4448-1, BRR 219, Ketekijoha (QC), OR 2621-18, Narendra Vishnu Bhog, ORB-2-KM-3, R 2356-218-98-1, NVSR 1054, HUR 2302, BRR 2277, RNR 15435, TPUR-K-02, Narendra Tilak Chandra, HUR 2301, Narendra Vikram TCR, RP 6475-CGR 1-1-IL-1-2124-1-58 ASG, TRC 308-1-3-5, TRC 395-2-4-2, TRC 138, JhilliDhan Mutant 15-1, TRC 171-2-5-1, NVSR 6532, RNR 31670, KMP 245, RP Bio 4919-NSR23, NVSR 6580, CSR 36, RNR 39000, CSR 2021-ST-294-168, CSR 23, NVSR 6630, KMP 246, CSR 10, CSR 2021-AL-2-94-112, RP 6616-CGR 23-CGIL-39-CGK 1-2124-39, CSR 2021-AL-294-72, DRR Dhan 58, Pusa 44, FL 478, RP 6616-CGR 24-

CGIL-45-CGK 1-2124-49, RP Bio 4919-NSR 61, HURS 23-15, RP 6747-19087-1-1, CR 4466-126-WB-1, RP 6256-RJ/RIL-RJ385, CR 3426-115-125-11, CR 4397-4-6-27, RCPL 1-441, Swarna, RP 5976-26-13-12-88, RP 6772-MSA 16-439, RP Bio 4919-NSR 105, RP 6238-BV/RIL-RV132, CR 4432-3-2-2-1-1-1, Rasi, CR 4467-RGA-100, RP 6774-19095, RP 6737-MS-M-RP-KP-87, CR 4414-1-1-1-1-2-1, CR 4352-3-1-1-2-1-1, Vandana, RP 5976-27-26-4-91, RP 6238-RV/RIL-RV190, RP 6459-DB9, RP 6736-KS-62-8-7, RP 6773-MSAC 4-5, RP 6255-SP/RIL-SP38-1, RP 6736-MS-M-93-89, Improved Samba Mahsuri, NVSR 1163, RP 6460-C3-206, RP 6252-BV/RIL-BV31, RP 6533-15-21-6-1, CR 4478-1-3-1-1-3-1, RP 6254-SB/RIL-SB261, Swarna, RP 6256-RJ/RIL-RJ162, RP 6427-db-111, NVSR 1139, RP 6734-JS-1-2-6, CR 4477-2-3-2-1-1-1, NVSR 1184, Rasi, RP 6736-SP-M-MS-KS-63-10-4, CR 4340-2-7-GSR IR2-1-R6-N1 N1-N41-N2, RP 6257-SJ/RIL-SJ1704, CR 3522-4-1-1-1-1-1, RP 6458-C1-151, CR 4374-3-1-2-1-1, Improved Samba Mahsuri, RP 6533-36-45-27-9, RP 5976-27-2-4-19, CR 4483-2-2-2-1-3-1, RP 6252-BV/RIL-BV305, DRR Dhan 64, RP 6257-SJ/RIL-SJ228, RP 6681-RMS-27-19-69-82, CR 4468-RGA-162-3, Varadhan, R-RHP-IC-148, RNR 31668, CSR HZR 1, AD21270, CK 145-3, RP 6731-BCRK/RIL-BCRK-4, RP Bio 4918-NPS 21, CSR HZR 5, RP 6771-IRRI-147, NVSR 649, KMP 258, CR 4225-B-1-1-2, BPT 5204, RP 6514-IR128768-7-2-2-4, RP 6615-MK/RIL-FBMI-2-1, NVSR 787, UPR 4640-11-1-1-1, Gurmatiya sel.1, IR 124041-B-3-1-1-B, GNV 2075, RP 6458-C1-151, IR 64, HURS 23-10, RNR 31672, RP 6731-BCRK/RIL-BCRK-9, CK 35-3, CSR 2021-294-164, AD21205, ORR 1814, RP 6195-MC/RIL-SM4A-A57, CB 21102, DRR Dhan 45, SKL 10-15-593-162-25-106-70, RP 6731-BCRK/RIL-BCRK-4-1-P, CR 4107-1-B-4-1-B, R-56, R-RHP-IR-142, DRR Dhan 48, HURS 23-8, RNR 34998, RP 6615-MK/RIL-FBMI-45-1-5-1, RP 6167-RN-116, NVSR 658, CR 4199-2-B-1-2-B-2, Kalanamak 2020-3, CSR H3R 17-42, RP 6195-MC/RIL-SM5A-60, Chittimuthyalu, UPR 2879-98-105, RP 6733-SP-M-KS-57-4-5, NDR 8418-3, CR 4283-274-6-2-1-3, CR 3478-M-11-B-1, MCM 140, CSR 2018-43-36, CR 3460-E-2-2-B-1, MCM 138, CSR 2018-43-18, NVSR 6572, MTU 1420, RP Bio 4919-NSR 13, Bhuthnath, CCARI/GRS 10-7-146-2, CR 3439-E-5-2-1-1-B-1, CSR 2018-43-16, CR 4087-5-B-1, NVSR 6642, CSR 2018-43-37, CSR 10, CR 4256-247-9-2-2-1-1-1, MLD 215-IR 82635-B-B-75-2, CR 2839-1-5-B-1-5-1-B-9-1-1-1, CR 4086-5-B-7-B-1, NVSR-6531, CR 4086-5-B-10-5-B-1, MCM-142, CR 4303-294-5-4-2-1-1-2, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001, CR 4290-281-14-3-1-1-1-1, FL 478, CR 4301-292-3-4-2-1-1-1-1, CR 2845-S-B-B-4-1-1-4, CR 2845-S-B-B-4-1-1-4, CCARI/GRS11-2-174-9, CR 4181-4-B-1, MTU 1421, MCM-144, CR 4202-286-22-1, CR 4482-1-IR16L1795, CCARI/GR9-5-163-12, CR 4285-276-6-3-1-1-1-1, Pusa 44, CN 2172-13-10-1-1, RP 6166-47-1-21-1, KR 21003, KR 21001, KR 21002, ADT 45, NVSR 788, BPT 2841, RP 6166-NPV 37-23, Improved Shri Karnal, BKR 525, BPT 3136, CSR 414-63, CR 4327-5-2-1-1, RP 6615-MK/RIL-FBMI-45-32-6, BPT 3148, KJT 23-MG-02, BPT 3344, Improved Khuddi, BPT 3263, AAU-TTB DHAN-41, BPT 3378, CSR-KR-41-4-171, NVSR 651, CR 4450-65-15-3-5-2, RP 6615-MK/RIL-FBMI-45-25-6-1, BPT 2858, CR 4450-48-1-1-10-26-1-21-7-19, BPT 3141, ADKKV 20001, BPT 3269, NVSR 757, RKM Sel-1, RP 6615-MK/RIL-FBMI-45-31-6-1, NVSR 3661, Choharto, Jyothi, Kauni, Uma, HR-12, IR-64, Rasi, TN1, Vikramarya, Nidhi, CH-45, Benibhog, IR-50, Swarnadhan, Ajaya and RP-Bio-226.

- 5 (Moderately Susceptible)** RP 4396-1-13-11, NDR 8806-TFR-3, GNV 2188-1, AD 21184, BNP 401, OROI-11-IR 88243-17-1-1-3, CB 17504, Pusa 2087-40-19-4-1, RP 6529-52-5-7-9, CR 4388-RGA-245, CSR AP10, RP 6745-MSAC 23-49, CR 4077-1357-5-4-2-1-1, ORJ 1348, JNPT 581-64, KJT-23-3, KNM 13568, TRC 2023-51/IR126999-B-32-2-1-3, KMP 252, NDR TFR-10, NVSR 941, NLR 3819, Gontra Bidhan-3 (NC), CR 4388-RGA-60-53-1, UPR 461 1-1-1-1-1, RNR 38125, PAU 6707-22-1-2-2 (RYT 3889), BRR 0287-IR 143532-95-1-1-177 44-4, IR 19L1054, HURS-23-17-IR 143534-114-1-1 387-81-38, BKR 510, CR 4396-4-2-23, NWGR-17075, MTU 1392, CR 4415-3-1-3-1-3-1, KPS 10642, JGL 41240, CR 4343-15-2-1-1, R 2341-329-2-169-1, RNR 38966, CR 3506-1-2-3-1-2-1, OR 2577-5, RP 6721-LVS24-CN2103-21-11-2, RP 6744-19180-1-1, CR 4385-RGA-6-2, HKR 18-33, BRR 0053-IR 96321-10999-347-B 1-2, WGL-1740, PR 113, RP 6475-CGR 16-CGIL54-CGK2 1-2131-5, YNPK-7258, CR 4428-1-1-2-1-3-1, RP 6529-RMS-64-5-7-9, Pusa 2086-36-11-12-1, RP 6459-C2-sel12, CR 4396-291-2-6, HURS-23-2-IR 18A1565, ORR 1815, RP 6746-IR17A2831, SKL-8-33-1570-107-320-242-127, Surya 27, BRR-2134, Nath 20:20, JGL 41255, RP 6744-19023-1-1, Pusa 5567-21-1, JhilliDhan Mutant 19, KNM 14376, HKR 18-63, RP 6720-LVS2-CN-2094-16-7-1, PAU 10093-IR 129477-1629-14-1-4-1, MTU 1409, NVSR-931, NLR 4020, RNR 37913, RR 24-25, WGL-1537, NVSR-908, PAU 7682-1-3-1-1, KNM 15360, Pusa 2096-26, RCPR 101-IR107891-B-B-1432-2-1, CO 51 (NC), AD 21208, ODR-1-2-18-1, BRR-2107, CB 17502, RP 6420-C10-183, KJT-23-MG-13, CSR 2021-E-294-153, TRC 2023-41/TRC H2TC H2TN 5723-B-B-9-21, KMP-244, TRC 295-1-3-2, NWGR-19200, CR 4400-1-5-IR18L1130, UPR 4592-3-1-1-1, CR 4469-RGA-126-27, ORR

1813, CR 4406-14155-1-3-7-6-2-1, TRC 124-2-2-3, ShuatsDhan 11-IR18A1076, CR 4452, NWGR-18202, TM 13327, PR 124, HURS-23-16-IR 143511-78-2-2963-50-18, CR 2906-353-11-13, RNR 35989, BRR 0288, CR 4396-97-2-4, HURS-23-12-IR18A2005, R 1672-126-1-24-1, CR 4472-1-1-2-1-1-1, BKR 421, CR 4418-4-1-2-1-2-1, Sanchuriya Mutant 12, Tilkormel Mutant-12, CR 4379-4-1-1-1, TRC 2023-22 / TRC TNTJ 5370-B B-1-5, RP 6680-RMS-3-5-9-16, KPS-10631, CR 4469-RGA-9, KJT 23-MG-32, CB 18577, Pusa 2095-23, AD 21209, AD 19748, BPT 3227, CR 3842-62-5-1-1-1, OROI-5-IR 86256-6-2-2-2, BRR 2140, CB 20164, Pusa 2085-36-9-5-7, RP 6744-19408-1-1, ORJ 1311, JGL 37088, KJT-23-2, KNM 12510, PAU 6231-49-1-4-1-1, MTU 1413, NDR 359 (NC), NVSR 1065, CR 3504-19-2-2-1-1-1, UPR 4631-1-1-1-1, RGL 7032, CR 4409-1-1-1-1-1-1, R 2282-556-1-312-1, RNR 31755, BKR 455, BRR 0252, HURS 23-9-IR 11A282, WGL 1752, AD 19538, OR 2658-1, CB 20117, BRR 2128, PR 121, Shri Ram Super 7700, Pusa 2084-38-1-4-1, CR 4396-184-4-2, RP 6460-C3-312, CRAC 3994-2-2, NLR 3802, RP 6528-RMS-2-24-44-66, MTU 1412, TRC 2023-52-IR18A1042, JGL 38935, CR 4379-4-3-1-1-5-1, RGL 7028, UPR 4626-2-1-1-1, IR 127607-4-B-B-B-1, SHUATS Dhan 10-IR 18A1926, R 2299-3671-1-254-1, RNR 34979, CR 4456-8-3-2-1, NDR BARC-6, HKR 15-32, CR 4396-3-16—1, PAU 7669-44, NPT 1059-9, CRAC 3998-221-2, BRR 0277, RP 6533-RMS-9-21-33-45, R 2370-496-1-278-1, CR 3785-1-1-1-1-4-1, RP 6532-27-18-6-3, NVSR 1219, RP 6346-14-24-63-85, Pusa 5544-16-4-2-1-1-3, AD 20420, OROI-9-IR 88230-60-1-2-2, BRR 2228, Pusa 2082-40-3-19-1, RP 6346-8-32-43-75, KJT 23-21-41, KNM 12472, KMP 264, MTU 1416, Purvakamini, KPS 10467, PAN 21514, PHI-23106, RGL 7030, BRR 0235, VDN 1808, CR 4464-9-1-1-1-1, Swarna, NLR 4021, RP 6532-RMS-42-54-60-90, AD 20398, OR 2382-7, RP 6758-RMS 75-19-81-45, MLD 216-IR16T1437, CR 4356-1-5-1-2-1-1, PAN 2440, PUR K-IR17L1177, CR 4353-2-2-1-1-1-1, KHP 15, RP 6759-CGR 26-CGIL-79-CGK 2-1-2131-30, Pusa 2083-40-16-10-4, CN 2163-177-1-1-1, RP 6736-MS-M-84-6-2, CR 4211-2-1-1-1-1, PAN 21039, PHI-23105, CR 4454-4-3-4-2-1, Pusa 44, WGL 1745, HURS 23-6-IR100842-B-BRGA-BRGAB-RGA-9, PHI-23104, CRHR 702, OROI-12-IR 88250-20-1-1-3, RP 6760-IR17A 2231, BPT 3287, TRC 2023-28 -TRC GK 5400-B B-11-4, Pusa 2082-40-16-4-4, MRP 5222, MTU 1415, CR 4203-225-2, KAUPTB-mut-46-1-1-2-1, PHI-23107, RGL 7031, R 2451-225-1-25-1, CR 3856-44-22-2-1-11-4-2-4-1, RP Bio 4918-NPS1, RP 6354-RMS-1-46-79-87, KJT-23-21-27, Shweta-43, CR 4455-197-4-2-1, Khushi-27, SVM11, AD 21039, BPT 3159, CB 20166, Pusa 5477-28-30-2-1-1-3-3, RP 6747-19487-1-1, KPS 10320, CSR-MGC-63, P.3334, TRC 2023-39, RP 6681-RMS-1-79-64-43, MTU 1419, NVSR-933, NWGR 18121, CRAC 3998-128-2, CR 4479-3-2-1-1-1-1, NP 9993, BKR 245, R 2370-115-1-93-1, RNR 41216, BRR 0285, Telangana Sona, WGL 1722, CR 3583-3-2-2-1-1-1, RP 6528-RMS-2-7-11-3, CB 20143, BPT 3127, AD 21193, RP 6460-C3-345-12, CR 3856-44-22-2-1-11-4-5-5, RAU 1407-13-3, MTU 1418, WGL-14, NWGR 19219, TRC 2023-37, CR 4376-1-1-1-2-1-1, RGL 7033, SYE 930-8-25, CR 3573-3-1-3-1-1-1, RP 6766-CGR 27-CGIL-92-CGK 143-2135-5, Pusa 5377-4-1-1-2-2-1, AD 19566, RP 6768-RMS 3-6-9-18, KPS 10375, TRC 2023-26 / TRC SMTC 5488 B-B-11-41, BPT 5204, NDR 2022-1-2, NWGR 17121, RNR 38123, WGL 1724, NVSR 991, RP 6769-1144-12-1-2-1-2, Improved Samba Mahsuri, RP 6770-960-22-10-3-1, CB 18920, HTW 101-IR16A2106, BRR 2278, RP Bio 4919-NSR 96, IRRH-175, ADVRH 200070, NVSR 1141, CR 4457-IR 129477-4026-249-15 1-4, TRC 2023-3 / TRC H2N 5421-B-B 3-7, RP 6615-MK/RIL-FBMI-28-21-2, CB HTR 22001, CR 3426-225-65-11, RCPL-1-443, RP 6761-MSAC 26-IR144575-61 2-1-1-B, BRR 2274, ODR-1-2-18-2, RP 6460-C3-313, CR 4471-1-3-1-5-6, RCPR 100-IR83929-B-B-291-3-1-1, DRR Dhan 54, CRHR 189, NWGR-18096, IR 136734-53-1-1-1-1-1, PAU-IR 129477-709-375-3-5-7, JDP 5925, RP 6759-CGR19-CGIL-68-CGK 2-1-2131-68-2, CR 4073-1339-2-3-4-5, RNR 28361, BKR 542, RP 6238-RV/RIL-RV 132-1-1, CRHR 188, CR Dhan 202, PAU-IR 129477-1629-210-4-4-4, RP 6744-JBSM 3-3-1, IR 18A1711, RP 6762-MSAC 16-24, CR 4207-288-11-1, NVSR 3674, IIABR-15/IIAB-304/IR12A223, CR 4399-4393-A13-16-N7-4, PA 6129, CR 4459-3-1-1-1-1, TRC 2023-2 / TRC TJN5806-B-B-3-11, RP 6763-CGR 28-IR144572-20-4 1-1-B, KMP 256, R 2341-252-2-165-1, HURS-23-3-IR18A1658, RNR 37982, CR 4474-1-1-3-1-1-1, RP 5976-26-30-12-16, CSR 2021-DSR-29-4-194, R 2773-C-8-1-1, CR-4460-8-1-1-1-1, IR-14F-717, DRR H-4, IRRH-176, HURS-23-13-IR18A1776, CR 4399-4393-A13-7-N4-4, CSR 2021-DSR-2-94-134, RP 6238-RV/RIL-RV 14, RP 6529-RMS-88-1-2-4, HURS 22-6, BKR 405, R 2449-1032-1-462-1, JKOJM-300-158-11, Alsakar Mutant 19, JR 14, OR 2594-5, Shobini (NC), CR 4448-2, JKOJM-300-584-5, Narendra Juhi Bengal, ORB-3GM-4, Badshahog Sel.1, AAU-KMJ/DHAN-47, KAUPTB-TRV-EBC-14, BRR-0215, Dubraj Sel. 1, ORB-1-BM-1, CR 4448-1, BRR 219, Ketekijoha (QC), OR 2621-18, Narendra Vishnu Bhog, ORB-2-KM-3, R 2356-218-98-1, NVSR 1054, HUR 2302, BRR 2277, RNR 15435, TPUR-K-02, Narendra Tilak Chandra, HUR 2301, Narendra Vikram TCR, RP 6475-CGR 1-1-IL-1-2124-1-58 ASG, TRC 308-1-3-5, TRC 395-2-4-2, TRC 138, JhilliDhan Mutant

15-1, TRC 171-2-5-1, NVSR 6532, RNR 31670, KMP 245, RP Bio 4919-NSR23, NVSR 6580, CSR 36, RNR 39000, CSR 2021-ST-294-168, CSR 23, NVSR 6630, KMP 246, CSR 10, CSR 2021-AL-2-94-112, RP 6616-CGR 23-CGIL-39-CGK 1-2124-39, CSR 2021-AL-294-72, DRR Dhan 58, Pusa 44, FL 478, RP 6616-CGR 24-CGIL-45-CGK 1-2124-49, RP Bio 4919-NSR 61, HURS 23-15, RP 6747-19087-1-1, CR 4466-126-WB-1, RP 6256-RJ/RIL-RJ385, CR 3426-115-125-11, CR 4397-4-6-27, RCPL 1-441, Swarna, RP 5976-26-13-12-88, RP 6772-MSA 16-439, RP Bio 4919-NSR 105, RP 6238-BV/RIL-RV132, CR 4432-3-2-2-1-1-1, Rasi, CR 4467-RGA-100, RP 6774-19095, RP 6737-MS-M-RP-KP-87, CR 4414-1-1-1-1-2-1, CR 4352-3-1-1-2-1-1, Vandana, RP 5976-27-26-4-91, RP 6238-RV/RIL-RV190, RP 6459-DB9, RP 6736-KS-62-8-7, RP 6773-MSAC 4-5, RP 6255-SP/RIL-SP38-1, RP 6736-MS-M-93-89, Improved Samba Mahsuri, NVSR 1163, RP 6460-C3-206, RP 6252-BV/RIL-BV31, RP 6533-15-21-6-1, CR 4478-1-3-1-1-3-1, RP 6254-SB/RIL-SB261, Swarna, RP 6256-RJ/RIL-RJ162, RP 6427-db-111, NVSR 1139, RP 6734-JS-1-2-6, CR 4477-2-3-2-1-1-1, NVSR 1184, Rasi, RP 6736-SP-M-MS-KS-63-10-4, CR 4340-2-7-GSR IR2-1-R6-N1 N1-N41-N2, RP 6257-SJ/RIL-SJ1704, CR 3522-4-1-1-1-1-1, RP 6458-C1-151, CR 4374-3-1-2-1-1, Improved Samba Mahsuri, RP 6533-36-45-27-9, RP 5976-27-2-4-19, CR 4483-2-2-2-1-3-1, RP 6252-BV/RIL-BV305, DRR Dhan 64, RP 6257-SJ/RIL-SJ228, RP 6681-RMS-27-19-69-82, CR 4468-RGA-162-3, Varadhan, R-RHP-IC-148, RNR 31668, CSR HZR 1, AD 21270, CK 145-3, RP 6731-BCRK/RIL-BCRK-4, RP Bio 4918-NPS 21, CSR HZR 5, RP 6771-IRRI-147, NVSR 649, KMP 258, CR 4225-B-1-1-2, BPT 5204, RP 6514-IR128768-7-2-2-4, RP 6615-MK/RIL-FBMI-2-1, NVSR 787, UPR 4640-11-1-1-1, Gurmatiya sel.1, IR 124041-B-3-1-1-B, GNV 2075, RP 6458-C1-151, IR 64, HURS 23-10, RNR 31672, RP 6731-BCRK/RIL-BCRK-9, CK 35-3, CSR 2021-294-164, AD 21205, ORR 1814, RP 6195-MC/RIL-SM4A-A57, CB 21102, DRR Dhan 45, SKL 10-15-593-162-25-106-70, RP 6731-BCRK/RIL-BCRK-4-1-P, CR 4107-1-B-4-1-B, R-56, R-RHP-IR-142, DRR Dhan 48, HURS 23-8, RNR 34998, RP 6615-MK/RIL-FBMI-45-1-5-1, RP 6167-RN-116, NVSR 658, CR 4199-2-B-1-2-B-2, Kalanamak 2020-3, CSR H3R 17-42, RP 6195-MC/RIL-SM5A-60, Chittimuthyalu, UPR 2879-98-105, RP 6733-SP-M-KS-57-4-5, NDR 8418-3, CR 4283-274-6-2-1-3, CR 3478-M-11-B-1, MCM 140, CSR 2018-43-36, CR 3460-E-2-2-B-1, MCM 138, CSR 2018-43-18, NVSR 6572, MTU 1420, RP Bio 4919-NSR 13, Bhuthnath, CCARI/GRS 10-7-146-2, CR 3439-E-5-2-1-1-B-1, CSR 2018-43-16, CR 4087-5-B-1, NVSR 6642, CSR 2018-43-37, CSR 10, CR 4256-247-9-2-2-1-1-1, MLD 215-IR 82635-B-B-75-2, CR 2839-1-5-B-1-5-1-B-9-1-1-1, CR 4086-5-B-7-B-1, NVSR-6531, CR 4086-5-B-10-5-B-1, MCM-142, CR 4303-294-5-4-2-1-1-2, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001, CR 4290-281-14-3-1-1-1-1, FL 478, CR 4301-292-3-4-2-1-1-1-1, CR 2845-S-B-B-4-1-1-4, CR 2845-S-B-B-4-1-1-4, CCARI/GRS11-2-174-9, CR 4181-4-B-1, MTU 1421, MCM-144, CR 4202-286-22-1, CR 4482-1-IR16L1795, CCARI/GR9-5-163-12, CR 4285-276-6-3-1-1-1-1, Pusa 44, CN 2172-13-10-1-1, RP 6166-47-1-21-1, KR 21003, KR 21001, KR 21002, ADT 45, NVSR 788, BPT 2841, RP 6166-NPV 37-23, Improved Shri Karnal, BKR 525, BPT 3136, CSR 414-63, CR 4327-5-2-1-1, RP 6615-MK/RIL-FBMI-45-32-6, BPT 3148, KJT 23-MG-02, BPT 3344, Improved Khuddi, BPT 3263, AAU-TTB DHAN-41, BPT 3378, CSR-KR-41-4-171, NVSR 651, CR 4450-65-15-3-5-2, RP 6615-MK/RIL-FBMI-45-25-6-1, BPT 2858, CR 4450-48-1-1-10-26-1-21-7-19, BPT 3141, ADKKV 20001, BPT 3269, NVSR 757, RKM Sel-1, RP 6615-MK/RIL-FBMI-45-31-6-1, NVSR 3661, Choharto, Jyothi, Kauni, Uma, HR-12, IR-64, Rasi, TN1, Vikramarya, Nidhi and CH-45.

7 (Susceptible) GNV 2188-1, AD 21184, BNP-401, OROI-11-IR 88243-17-1-1-3, CB 17504, Pusa 2087-40-19-4-1, RP 6529-52-5-7-9, CR 4388-RGA-245, CSRAP10, RP 6745-MSAC 23-49, CR 4077-1357-5-4-2-1-1, ORJ 1348, JNPT 581-64, KJT-23-3, KNM 13568, TRC 2023-51/IR126999-B-32-2-1 3, KMP 252, NDR TFR-10, NVSR 941, NLR 3819, Gontra Bidhan-3 (NC), CR 4388-RGA-60-53-1, UPR 4611-1-1-1-1-1, RNR 38125, PAU 6707-22-1-2-2 (RYT 3889), BRR 0287-IR 143532-95-1-1-177 44-4, IR 19L1054, HURS-23-17-IR 143534-114-1-1 387-81-38, BKR 510, CR 4396-4-2-23, NWGR-17075, MTU 1392, CR 4415-3-1-3-1-3-1, KPS 10642, JGL 41240, CR 4343-15-2-1-1, R 2341-329-2-169-1, RNR 38966, CR 3506-1-2-3-1-2-1, OR 2577-5, RP 6721-LVS24-CN2103-21-11-2, RP 6744-19180-1-1, CR 4385-RGA-6-2, HKR 18-33, BRR 0053-IR 96321-10999-347-B 1-2, WGL-1740, PR 113, RP 6475-CGR 16-CGIL54-CGK2 1-2131-5, YNPK-7258, CR 4428-1-1-2-1-3-1, RP 6529-RMS-64-5-7-9, Pusa 2086-36-11-12-1, RP 6459-C2-sel12, CR 4396-291-2-6, HURS-23-2-IR 18A1565, ORR 1815, RP 6746-IR17A2831, SKL-8-33-1570-107-320-242-127, Surya 27, BRR-2134, Nath 20:20, JGL 41255, RP 6744-19023-1-1, Pusa 5567-21-1, JhilliDhan Mutant 19, KNM 14376, HKR 18-63, RP 6720-LVS2-CN-2094-16-7-1, PAU 10093-IR 129477-1629-14-1 4-1, MTU 1409, NVSR-931, NLR 4020, RNR 37913, RR 24-25, WGL-1537, NVSR-908, PAU 7682-1-3-1-1, KNM 15360, Pusa 2096-26, RCPR 101-IR107891-B-B-1432-2-1, CO 51 (NC), AD 21208, ODR-1-2-18-1, BRR-2107, CB 17502, RP 6420-C10-183, KJT-23-MG-13, CSR 2021-E-294-

153, TRC 2023-41/ TRC H2TC H2TN 5723-B-B-9-21, KMP-244, TRC 295-1-3-2, NWGR-19200, CR 4400-1-5-IR18L1130, UPR 4592-3-1-1-1, CR 4469-RGA-126-27, ORR 1813, CR 4406-14155-1-3-7-6-2-1, TRC 124-2-2-3, ShuatsDhan 11-IR18A1076, CR 4452, NWGR-18202, TM 13327, PR 124, HURS-23-16-IR 143511-78-2-2963-50-18, CR 2906-353-11-13, RNR 35989, BRR 0288, CR 4396-97-2-4, HURS-23-12-IR18A2005, R 1672-126-1-24-1, CR 4472-1-1-2-1-1-1, BKR 421, CR 4418-4-1-2-1-2-1, Sanchuriya Mutant 12, Tilkormel Mutant-12, CR 4379-4-1-1-1, TRC 2023-22/ TRC TNTJ 5370-B-B-1-5, RP 6680-RMS-3-5-9-16, KPS-10631, CR 4469-RGA-9, KJT 23-MG-32, CB 18577, Pusa 2095-23, AD 21209, AD 19748, BPT 3227, CR 3842-62-5-1-1-1, OROI-5-IR 86256-6-2-2-2, BRR 2140, CB 20164, Pusa 2085-36-9-5-7, RP 6744-19408-1-1, ORJ 1311, JGL 37088, KJT-23-2, KNM 12510, PAU 6231-49-1-4-1-1, MTU 1413, NDR 359 (NC), NVSR 1065, CR 3504-19-2-2-1-1-1, UPR 4631-1-1-1-1, RGL 7032, CR 4409-1-1-1-1-1-1, R 2282-556-1-312-1, RNR 31755, BKR 455, BRR 0252, HURS 23-9-IR 11A282, WGL 1752, AD 19538, OR 2658-1, CB 20117, BRR 2128, PR 121, Shri Ram Super 7700, Pusa 2084-38-1-4-1, CR 4396-184-4-2, RP 6460-C3-312, CRAC 3994-2-2, NLR 3802, RP 6528-RMS-2-24-44-66, MTU 1412, TRC 2023-52-IR18A1042, JGL 38935, CR 4379-4-3-1-1-5-1, RGL 7028, UPR 4626-2-1-1-1, IR 127607-4-B-B-B-1, SHUATS Dhan 10-IR 18A1926, R 2299-3671-1-254-1, RNR 34979, CR 4456-8-3-2-1, NDR BARC -6, HKR 15-32, CR 4396-3-16—1, PAU 7669-44, NPT 1059-9, CRAC 3998-221-2, BRR 0277, RP 6533-RMS-9-21-33-45, R 2370-496-1-278-1, CR 3785-1-1-1-1-4-1, RP 6532-27-18-6-3, NVSR 1219, RP 6346-14-24-63-85, Pusa 5544-16-4-2-1-1-3, AD 20420, OROI-9-IR 88230-60-1-2-2, BRR 2228, Pusa 2082-40-3-19-1, RP 6346-8-32-43-75, KJT 23-21-41, KNM 12472, KMP 264, MTU 1416, Purvakamini, KPS 10467, PAN 21514, PHI-23106, RGL 7030, BRR 0235, VDN 1808, CR 4464-9-1-1-1-1, Swarna, NLR 4021, RP 6532-RMS-42-54-60-90, AD 20398, OR 2382-7, RP 6758-RMS 75-19-81-45, MLD 216-IR16T1437, CR 4356-1-5-1-2-1-1, PAN 2440, PUR K-IR17L1177, CR 4353-2-2-1-1-1-1, KHP 15, RP 6759-CGR 26-CGIL-79-CGK 2-1-2131-30, Pusa 2083-40-16-10-4, CN 2163-177-1-1-1, RP 6736-MS-M-84-6-2, CR 4211-2-1-1-1-1, PAN 21039, PHI-23105, CR 4454-4-3-4-2-1, Pusa 44, WGL 1745, HURS 23-6-IR100842-B-BRGA-BRGAB-RGA-9, PHI-23104, CRHR 702, OROI-12-IR 88250-20-1-1-3, RP 6760-IR17A 2231, BPT 3287, TRC 2023-28 -TRC GK 5400-B-B-11-4, Pusa 2082-40-16-4-4, MRP 5222, MTU 1415, CR 4203-225-2, KAU PTB-mut-46-1-1-2-1, PHI-23107, RGL 7031, R 2451-225-1-25-1, CR 3856-44-22-2-1-11-4-2-4-1, RP Bio 4918-NPS1, RP 6354-RMS-1-46-79-87, KJT-23-21-27, Shweta-43, CR 4455-197-4-2-1, Khushi-27, SVM11, AD 21039, BPT 3159, CB 20166, Pusa 5477-28-30-2-1-1-3-3, RP 6747-19487-1-1, KPS 10320, CSR-MGC-63, P.3334, TRC 2023-39, RP 6681-RMS-1-79-64-43, MTU 1419, NVSR-933, NWGR 18121, CRAC 3998-128-2, CR 4479-3-2-1-1-1-1, NP 9993, BKR 245, R 2370-115-1-93-1, RNR 41216, BRR 0285, Telangana Sona, WGL 1722, CR 3583-3-2-2-1-1-1, RP 6528-RMS-2-7-11-3, CB 20143, BPT 3127, AD 21193, RP 6460-C3-345-12, CR 3856-44-22-2-1-11-4-5-5, RAU 1407-13-3, MTU 1418, WGL-14, NWGR 19219, TRC 2023-37, CR 4376-1-1-1-2-1-1, RGL 7033, SYE 930-8-25, CR 3573-3-1-3-1-1-1, RP 6766-CGR 27-CGIL-92-CGK 143-2135-5, Pusa 5377-4-1-1-2-2-1, AD 19566, RP 6768-RMS 3-6-9-18, KNM 12368, CRAC 3998-247-2, NP 6161, RGL 7034, NVSR 3606", ={"CRAC 3998-325-3, RP 6767-CGR 25-CGIL-70 CGK2-1-2131-21, BRR 2135, RP 6449-db-235, KPS 10375, TRC 2023-26/ TRC SMTc 5488 B-B-11-41, BPT 5204, NDR 2022-1-2, NWGR 17121, RNR 38123, WGL 1724, NVSR 991, RP 6769-1144-12-1-2-1-2, Improved Samba Mahsuri, RP 6770-960-22-10-3-1, CB 18920, HTW 101-IR16A2106, BRR 2278, RP Bio 4919-NSR 96, IIRRH-175, ADVRH 200070, NVSR 1141, CR 4457-IR 129477-4026-249-15 1-4, TRC 2023-3 / TRC H2N 5421-B-B-3-7, RP 6615-MK/RIL-FBMI-28-21-2, CB HTR 22001, CR 3426-225-65-11, RCPL-1-443, RP 6761-MSAC 26-IR144575-61 2-1-1-B, BRR 2274, ODR-1-2-18-2, RP 6460-C3-313, CR 4471-1-3-1-5-6, RCPR 100-IR83929-B-B-291-3-1-1, DRR Dhan 54, CRHR 189, NWGR-18096, IR 136734-53-1-1-1-1-1, PAU-IR 129477-709-375-3-5-7, JDP 5925, RP 6759-CGR 19-CGIL-68-CGK 2-1-2131-68-2, CR 4073-1339-2-3-4-5, RNR 28361, BKR 542, RP 6238-RV/RIL-RV 132-1-1, CRHR 188, CR Dhan 202, PAU-IR 129477-1629-210-4-4-4, RP 6744-JBSM 3-3-1, IR 18A1711, RP 6762-MSAC 16-24, CR 4207-288-11-1, NVSR 3674, IIABR-15/IIAB-304/IR12A223, CR 4399-4393-A13-16-N7-4, PA6129, CR 4459-3-1-1-1-1, TRC 2023-2/ TRC TJN5806-B-B-3-11, RP 6763-CGR 28-IR144572-20-4 1-1-B, KMP 256, R 2341-252-2-165-1, HURS-23-3-IR18A1658, RNR 37982, CR 4474-1-1-3-1-1-1, RP 5976-26-30-12-16, CSR 2021-DSR-29-4-194, R 2773-C-8-1-1, CR-4460-8-1-1-1-1, IR-14F-717, DRR H-4, IIRRH-176, HURS-23-13-IR18A1776, CR 4399-4393-A13-7-N4-4, CSR 2021-DSR-2-94-134, RP 6238-RV/RIL-RV 14, RP 6529-RMS-88-1-2-4, HURS 22-6, BKR 405, R 2449-1032-1-462-1, JKOJM-300-158-11, Alsakar Mutant 19, JR 14, OR 2594-5, Shobini (NC), CR 4448-2, JKOJM-300-584-5, Narendra Juhi Bengal, ORB-3GM-4, Badshahog Sel.1, AAU-KMJ DHAN-47, KAUPTB-TRV-EBC-14, BRR-0215, Dubraj Sel. 1, ORB-1-BM-1, CR 4448-1, BRR 219, Ketekijoha (QC), OR

2621-18, Narendra Vishnu Bhog, ORB-2-KM-3, R 2356-218-98-1, NVSR 1054, HUR 2302, BRR 2277, RNR 15435, TPUR-K-02, Narendra Tilak Chandra, HUR 2301, Narendra Vikram TCR, RP 6475-CGR 1-1-IL-1-2124-1-58 ASG, TRC 308-1-3-5, TRC 395-2-4-2, TRC 138, JhilliDhan Mutant 15-1, TRC 171-2-5-1, NVSR 6532, RNR 31670, KMP 245, RP Bio 4919-NSR23, NVSR 6580, CSR 36, RNR 39000, CSR 2021-ST-294-168, CSR 23, NVSR 6630, KMP 246, CSR 10, CSR 2021-AL-2-94-112, RP 6616-CGR 23-CGIL-39-CGK 1-2124-39, CSR 2021-AL-294-72, DRR Dhan 58, Pusa 44, FL 478, RP 6616-CGR 24-CGIL-45-CGK 1-2124-49, RP Bio 4919-NSR 61, HURS 23-15, RP 6747-19087-1-1, CR 4466-126-WB-1, RP 6256-RJ/RIL-RJ385, CR 3426-115-125-11, CR 4397-4-6-27, RCPL 1-441, Swarna, RP 5976-26-13-12-88, RP 6772-MSA 16-439, RP Bio 4919-NSR 105, RP 6238-BV/RIL-RV132, CR 4432-3-2-2-1-1-1, Rasi, CR 4467-RGA-100, RP 6774-19095, RP 6737-MS-M-RP-KP-87, CR 4414-1-1-1-2-1, CR 4352-3-1-1-2-1-1, Vandana, RP 5976-27-26-4-91, RP 6238-RV/RIL-RV190, RP 6459-DB9, RP 6736-KS-62-8-7, RP 6773-MSAC 4-5, RP 6255-SP/RIL-SP38-1, RP 6736-MS-M-93-89, Improved Samba Mahsuri, NVSR 1163, RP 6460-C3-206, RP 6252-BV/RIL-BV31, RP 6533-15-21-6-1, CR 4478-1-3-1-1-3-1, RP 6254-SB/RIL-SB261, Swarna, RP 6256-RJ/RIL-RJ162, RP 6427-db-111, NVSR 1139, RP 6734-JS-1-2-6, CR 4477-2-3-2-1-1-1, NVSR 1184, Rasi, RP 6736-SP-M-MS-KS-63-10-4, CR 4340-2-7-GSR IR2-1-R6-N1 N1-N41-N2, RP 6257-SJ/RIL-SJ1704, CR 3522-4-1-1-1-1-1, RP 6458-C1-151, CR 4374-3-1-2-1-1, Improved Samba Mahsuri, RP 6533-36-45-27-9, RP 5976-27-2-4-19, CR 4483-2-2-2-1-3-1, RP 6252-BV/RIL-BV305, DRR Dhan 64, RP 6257-SJ/RIL-SJ228, RP 6681-RMS-27-19-69-82, CR 4468-RGA-162-3, Varadhan, R-RHP-IC-148, RNR 31668, CSR HZR 1, AD 21270, CK 145-3, RP 6731-BCRK/RIL-BCRK-4, RP Bio 4918-NPS 21, CSR HZR 5, RP 6771-IRRI-147, NVSR 649, KMP 258, CR 4225-B-1-1-2, BPT 5204, RP 6514-IR128768-7-2-2-4, RP 6615-MK/RIL-FBMI-2-1, NVSR 787, UPR 4640-11-1-1-1, Gurmatiya sel.1, IR 124041-B-3-1-1-B, GNV 2075, RP 6458-C1-151, IR 64, HURS 23-10, RNR 31672, RP 6731-BCRK/RIL-BCRK-9, CK 35-3, CSR 2021-294-164, AD 21205, ORR 1814, RP 6195-MC/RIL-SM4A-A57, CB 21102, DRR Dhan 45, SKL 10-15-593-162-25-106-70, RP 6731-BCRK/RIL-BCRK-4-1-P, CR 4107-1-B-4-1-B, R-56, R-RHP-IR-142, DRR Dhan 48, HURS 23-8, RNR 34998, RP 6615-MK/RIL-FBMI-45-1-5-1, RP 6167-RN-116, NVSR 658, CR 4199-2-B-1-2-B-2, Kalanamak 2020-3, CSR H3R 17-42, RP 6195-MC/RIL-SM5A-60, Chittimuthyalu, UPR 2879-98-105, RP 6733-SP-M-KS-57-4-5, NDR 8418-3, CR 4283-274-6-2-1-3, CR 3478-M-11-B-1, MCM 140, CSR 2018-43-36, CR 3460-E-2-2-B-1, MCM 138, CSR 2018-43-18, NVSR 6572, MTU 1420, RP Bio 4919-NSR 13, Bhuthnath, CCARI/GRS 10-7-146-2, CR 3439-E-5-2-1-1-B-1, CSR 2018-43-16, CR 4087-5-B-1, NVSR 6642, CSR 2018-43-37, CSR 10, CR 4256-247-9-2-2-1-1-1, MLD 215-IR 82635-B-B-75-2, CR 2839-1-5-B-1-5-1-B-9-1-1-1, CR 4086-5-B-7-B-1, NVSR-6531, CR 4086-5-B-10-5-B-1, MCM-142, CR 4303-294-5-4-2-1-1-2, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001, CR 4290-281-14-3-1-1-1-1, FL 478, CR 4301-292-3-4-2-1-1-1-1, CR 2845-S-B-B-4-1-1-4, CR 2845-S-B-B-4-1-1-4, CCARI/GRS11-2-174-9, CR 4181-4-B-1, MTU 1421, MCM-144, CR 4202-286-22-1, CR 4482-1-IR16L1795, CCARI/GR9-5-163-12, CR 4285-276-6-3-1-1-1-1, Pusa 44, CN 2172-13-10-1-1, RP 6166-47-1-21-1, KR 21003, KR 21001, KR 21002, ADT 45, NVSR 788, BPT 2841, RP 6166-NPV 37-23, Improved Shri Karnal, BKR 525, BPT 3136, CSR 414-63, CR 4327-5-2-1-1, RP 6615-MK/RIL-FBMI-45-32-6, BPT 3148, KJT 23-MG-02, BPT 3344, Improved Khuddi, BPT 3263, AAU-TTB DHAN-41, BPT 3378, CSR-KR-41-4-171, NVSR 651, CR 4450-65-15-3-5-2, RP 6615-MK/RIL-FBMI-45-25-6-1, BPT 2858, CR 4450-48-1-1-10-26-1-21-7-19, BPT 3141, ADKKV 20001, BPT 3269, NVSR 757, RKM Sel-1, RP 6615-MK/RIL-FBMI-45-31-6-1, NVSR 3661, Choharto, Jyothi, Kaumi, Uma, HR-12, IR-64, Rasi, TN1, Vikramarya, Nidhi, CH-45, Benibhog, IR-50, Swarnadhan, Ajaya, RP-Bio-226, CO-39 and Tetep.

9 (Highly Susceptible)

{“CR 4388-RGA-245, CSR AP10, RP 6745-MSAC 23-49, CR 4077-1357-5-4-2-1-1, ORJ 1348, JNPT 581-64, KJT-23-3, KNM 13568, TRC 2023-51/IR126999-B-32-2-1 3, KMP 252, NDR TFR-10, NVSR 941, NLR 3819, Gontra Bidhan-3 (NC), CR 4388-RGA-60-53-1, UPR 4611-1-1-1-1-1, RNR 38125, PAU 6707-22-1-2-2 (RYT 3889), BRR 0287-IR 143532-95-1-1-177 44-4, IR 19L1054, HURS-23-17-IR 143534-114-1-1 387-81-38, BKR 510, CR 4396-4—2—23, NWGR-17075, MTU 1392, CR 4415-3-1-3-1-3-1, KPS 10642, JGL 41240, CR 4343-15-2-1-1, R 2341-329-2-169-1, RNR 38966, CR 3506-1-2-3-1-2-1, OR 2577-5, RP 6721-LVS24-CN2103-21-11-2, RP 6744-19180-1-1, CR 4385-RGA-6-2, HKR 18-33, BRR 0053-IR 96321-10999-347-B 1-2, WGL-1740, PR 113, RP 6475-CGR 16-CGIL54-CGK2 1-2131-5, YNPK-7258, CR 4428-1-1-2-1-3-1, RP 6529-RMS-64-5-7-9, Pusa 2086-36-11-12-1, RP 6459-C2-sel12, CR 4396-291-2-6, HURS-23-2-IR 18A1565, ORR 1815, RP 6746-IR17A2831, SKL-8-33-1570-107-320-242-127, Surya 27, BRR-2134, Nath 20:20, JGL 41255, RP 6744-19023-1-1, Pusa 5567-21-1, JhilliDhan Mutant 19, KNM 14376, HKR 18-63, RP 6720-LVS2-CN-2094-16-7-1, PAU

10093-IR 129477-1629-14-1 4-1, MTU 1409, NVSR-931, NLR 4020, RNR 37913, RR 24-25, WGL-1537, NVSR-908, PAU 7682-1-3-1-1, KNM 15360, Pusa 2096-26, RCPR 101-IR107891-B-B-1432-2-1, CO 51 (NC), AD 21208, ODR-1-2-18-1, BRR-2107, CB 17502, RP 6420-C10-183, KJT-23-MG-13, CSR 2021-E-294-153, TRC 2023-41/ TRC H2TC H2TN 5723-B-B-9-21, KMP-244, TRC 295-1-3-2, NWGR-19200, CR 4400-1-5-IR18L1130, UPR 4592-3-1-1-1, CR 4469-RGA-126-27, ORR 1813, CR 4406-14155-1-3-7-6-2-1, TRC 124-2-2-3, ShuatsDhan 11-IR18A1076, CR 4452, NWGR-18202, TM 13327, PR 124, HURS-23-16-IR 143511-78-2-2 963-50-18, CR 2906-353-11-13, RNR 35989, BRR 0288, CR 4396-97-2-4, HURS-23-12-IR18A2005, R 1672-126-1-24-1, CR 4472-1-1-2-1-1-1, BKR 421, CR 4418-4-1-2-1-2-1, Sanchuriya Mutant 12, Tilkormel Mutant-12, CR 4379-4-1-1-1, TRC 2023-22/ TRC TNTJ 5370-B-B-1-5, RP 6680-RMS-3-5-9-16, KPS-10631, CR 4469-RGA-9, KJT 23-MG-32, CB 18577, Pusa 2095-23, AD 21209, AD 19748, BPT 3227, CR 3842-62-5-1-1-1, OROI-5-IR 86256-6-2-2-2, BRR 2140, CB 20164, Pusa 2085-36-9-5-7, RP 6744-19408-1-1, ORJ 1311, JGL 37088, KJT-23-2, KNM 12510, PAU 6231-49-1-4-1-1, MTU 1413, NDR 359 (NC), NVSR 1065, CR 3504-19-2-2-1-1-1, UPR 4631-1-1-1-1, RGL 7032, CR 4409-1-1-1-1-1-1, R 2282-556-1-312-1, RNR 31755, BKR 455, BRR 0252, HURS 23-9-IR 11A282, WGL 1752, AD 19538, OR 2658-1, CB 20117, BRR 2128, PR 121, Shri Ram Super 7700, Pusa 2084-38-1-4-1, CR 4396-184-4-2, RP 6460-C3-312, CRAC 3994-2-2, NLR 3802, RP 6528-RMS-2-24-44-66, MTU 1412, TRC 2023-52-IR18A1042, JGL 38935, CR 4379-4-3-1-1-5-1, RGL 7028, UPR 4626-2-1-1-1, IR 127607-4-B-B-B-1, SHUATS Dhan 10-IR 18A1926, R 2299-3671-1-254-1, RNR 34979, CR 4456-8-3-2-1, NDR BARC-6, HKR 15-32, CR 4396-3-16—1, PAU 7669-44, NPT 1059-9, CRAC 3998-221-2, BRR 0277, RP 6533-RMS-9-21-33-45, R 2370-496-1-278-1, CR 3785-1-1-1-1-4-1, RP 6532-27-18-6-3, NVSR 1219, RP 6346-14-24-63-85, Pusa 5544-16-4-2-1-1-3, AD 20420, OROI-9-IR 88230-60-1-2-2, BRR 2228, Pusa 2082-40-3-19-1, RP 6346-8-32-43-75, KJT 23-21-41, KNM 12472, KMP 264, MTU 1416, Purvakamini, KPS 10467, PAN 21514, PHI-23106, RGL 7030, BRR 0235, VDN 1808, CR 4464-9-1-1-1-1, Swarna, NLR 4021, RP 6532-RMS-42-54-60-90, AD 20398, OR 2382-7, RP 6758-RMS 75-19-81-45, MLD 216-IR16T1437, CR 4356-1-5-1-2-1-1, PAN 2440, PUR K-IR17L1177, CR 4353-2-2-1-1-1-1, KHP 15, RP 6759-CGR 26-CGIL-79-CGK 2-1-2131-30, Pusa 2083-40-16-10-4, CN 2163-177-1-1-1-1, RP 6736-MS-M-84-6-2, CR 4211-2-1-1-1-1, PAN 21039, PHI-23105, CR 4454-4-3-4-2-1, Pusa 44, WGL 1745, HURS 23-6-IR100842-B-BRGA-BRGAB-RGA-9, PHI-23104, CRHR 702, OROI-12-IR 88250-20-1-1-3, RP 6760-IR17A 2231, BPT 3287, TRC 2023-28 - TRC GK 5400-B B-11-4, Pusa 2082-40-16-4-4, MRP 5222, MTU 1415, CR 4203-225-2, KAUP TB-mut-46-1-1-2-1, PHI-23107, RGL 7031, R 2451-225-1-25-1, CR 3856-44-22-2-1-11-4-2-4-1, RP Bio 4918-NPS1, RP 6354-RMS-1-46-79-87, KJT-23-21-27, Shweta-43, CR 4455-197-4-2-1, Khushi-27, SVMM11, AD 21039, BPT 3159, CB 20166, Pusa 5477-28-30-2-1-1-3-3, RP 6747-19487-1-1, KPS 10320, CSR-MGC-63, P3334, TRC 2023-39, RP 6681-RMS-1-79-64-43, MTU 1419, NVSR-933, NWGR 18121, CRAC 3998-128-2, CR 4479-3-2-1-1-1-1, NP 9993, BKR 245, R 2370-115-1-93-1, RNR 41216, BRR 0285, Telangana Sona, WGL 1722, CR 3583-3-2-2-1-1-1, RP 6528-RMS-2-7-11-3, CB 20143, BPT 3127, AD 21193, RP 6460-C3-345-12, CR 3856-44-22-2-1-11-4-5-5, RAU 1407-13-3, MTU 1418, WGL-14, NWGR 19219, TRC 2023-37, CR 4376-1-1-1-2-1-1, RGL 7033, SYE 930-8-25, CR 3573-3-1-3-1-1-1, RP 6766-CGR 27-CGIL-92-CGK 143-2135-5, Pusa 5377-4-1-1-2-2-1, AD 19566, RP 6768-RMS 3-6-9-18, KNM 12368, CRAC 3998-247-2, NP 6161, RGL 7034, NVSR 3606, Samba Early, CRAC 3998-325-3, RP 6767-CGR 25-CGIL-70 CGK2-1-2131-21, BRR 2135, RP 6449-db-235, KPS 10375, TRC 2023-26/ TRC SMTC 5488 B-B-11-41, BPT 5204, NDR 2022-1-2, NWGR 17121, RNR 38123, WGL 1724, NVSR 991, RP 6769-1144-12-1-2-1-2, Improved Samba Mahsuri, RP 6770-960-22-10-3-1, CB 18920, HTW 101-IR16A2106, BRR 2278, RP Bio 4919-NSR 96, IIRRH-175, ADVRH 200070, NVSR 1141, CR 4457-IR 129477-4026-249-15 1-4, TRC 2023-3/ TRC H2N 5421-B-B 3-7, RP 6615-MK/RIL-FBMI-28-21-2, CB HTR 22001, CR 3426-225-65-11, RCPL-1-443, RP 6761-MSAC 26-IR144575-61 2-1-1-B, BRR 2274, ODR-1-2-18-2, RP 6460-C3-313, CR 4471-1-3-1-5-6, RCPR 100-IR83929-B-B-291-3-1-1, DRR Dhan 54, CRHR 189, NWGR-18096, IR 136734-53-1-1-1-1-1, PAU-IR 129477-709-375-3-5-7, JDP 5925, RP 6759-CGR19-CGIL-68-CGK 2-1-2131-68-2, CR 4073-1339-2-3-4-5, RNR 28361, BKR 542, RP 6238-RV/RIL-RV 132-1-1, CRHR 188, CR Dhan 202, PAU-IR 129477-1629-210-4-4-4, RP 6744-JBSM 3-3-1, IR 18A1711, RP 6762-MSAC 16-24, CR 4207-288-11-1, NVSR 3674, IIABR-15/IIAB-304/IR12A223, CR 4399-4393-A13-16-N7-4, PA 6129, CR 4459-3-1-1-1-1, TRC 2023-2/ TRC TJN5806-B-B-3-11, RP 6763-CGR 28-IR144572-20-4 1-1-B, KMP 256, R 2341-252-2-165-1, HURS-23-3-IR18A1658, RNR 37982, CR 4474-1-1-3-1-1-1, RP 5976-26-30-12-16, CSR 2021-DSR-29-4 194, R 2773-C-8-1-1, CR-4460-8-1-1-1-1, IR-14F-717, DRR H-4, IIRRH-176, HURS-23-13-IR18A1776, CR 4399-4393-A13-7-N4-4, CSR 2021-DSR-2-94-134, RP 6238-RV/RIL-RV 14, RP 6529-RMS-

88-1-2-4, HURS 22-6, BKR 405, R 2449-1032-1-462-1, JKOJM-300-158-11, Alsakar Mutant 19, JR 14, OR 2594-5, Shobini (NC), CR 4448-2, JKOJM-300-584-5, Narendra Juhi Bengal, ORB-3GM-4, Badshahog Sel.1, AAU-KMJDHAN-47, KAUPTB-TRV-EBC-14, BRR-0215, Dubraj Sel. 1, ORB-1-BM-1, CR 4448-1, BRR 219, Ketekijoha (QC), OR 2621-18, Narendra Vishnu Bhog, ORB-2-KM-3, R 2356-218-98-1, NVSR 1054, HUR 2302, BRR 2277, RNR 15435, TPUR-K-02, Narendra Tilak Chandra, HUR 2301, Narendra Vikram TCR, RP 6475-CGR 1-1-IL-1-2124-1-58 ASG, TRC 308-1-3-5, TRC 395-2-4-2, TRC 138, JhilliDhan Mutant 15-1, TRC 171-2-5-1, NVSR 6532, RNR 31670, KMP 245, RP Bio 4919-NSR23, NVSR 6580, CSR 36, RNR 39000, CSR 2021-ST-294-168, CSR 23, NVSR 6630, KMP 246, CSR 10, CSR 2021-AL-2-94-112, RP 6616-CGR 23-CGIL-39-CGK 1-2124-39, CSR 2021-AL-294-72, DRR Dhan 58, Pusa 44, FL 478, RP 6616-CGR 24-CGIL-45-CGK 1-2124-49, RP Bio 4919-NSR 61, HURS 23-15, RP 6747-19087-1-1, CR 4466-126-WB-1, RP 6256-RJ/RIL-RJ385, CR 3426-115-125-11, CR 4397-4-6-27, RCPL 1-441, Swarna, RP 5976-26-13-12-88, RP 6772-MSA 16-439, RP Bio 4919-NSR 105", = {"CSR HZR 5, RP 6771-IRRI-147, NVSR 649, KMP 258, CR 4225-B-1-1-2, BPT 5204, RP 6514-IR128768-7-2-2-4, RP 6615-MK/RIL-FBMI-2-1, NVSR 787, UPR 4640-11-1-1-1, Gurmatiya sel.1, IR 124041-B-3-1-1-B, GNV 2075, RP 6458-C1-151, IR 64, HURS 23-10, RNR 31672, RP 6731-BCRK/RIL-BCRK-9, CK 35-3, CSR 2021-294-164, AD 21205, ORR 1814, RP 6195-MC/RIL-SM4A-A57, CB 21102, DRR Dhan 45, SKL 10-15-593-162-25-106-70, RP 6731-BCRK/RIL-BCRK-4-1-P, CR 4107-1-B-4-1-B, R-56, R-RHP-IR-142, DRR Dhan 48, HURS 23-8, RNR 34998, RP 6615-MK/RIL-FBMI-45-1-5-1, RP 6167-RN-116, N(Moderately Susceptible)VSR 658, CR 4199-2-B-1-2-B-2, Kalanamak 2020-3, CSR H3R 17-42, RP 6195-MC/RIL-SM5A-60, Chittimthyalu, UPR 2879-98-105, RP 6733-SP-M-KS-57-4-5, NDR 8418-3, CR 4283-274-6-2-1-3, CR 3478-M-11-B-1, MCM 140, CSR 2018-43-36, CR 3460-E-2-2-B-1, MCM 138, CSR 2018-43-18, NVSR 6572, MTU 1420, RP Bio 4919-NSR 13, Bhuthnath, CCARI/GRS 10-7-146-2, CR 3439-E-5-2-1-1-B-1, CSR 2018-43-16, CR 4087-5-B-1, NVSR 6642, CSR 2018-43-37, CSR 10, CR 4256-247-9-2-2-1-1-1, MLD 215-IR 82635-B-B-75-2, CR 2839-1-5-B-1-5-1-B-9-1-1-1, CR 4086-5-B-7-B-1, NVSR-6531, CR 4086-5-B-10-5-B-1, MCM-142, CR 4303-294-5-4-2-1-1-2, CCSRI/GRS11-4-283-34, CR 4084-1-B-1-B-1, MLD 214-IR16T1001, CR 4290-281-14-3-1-1-1-1, FL 478, CR 4301-292-3-4-2-1-1-1-1, CR 2845-S-B-B-4-1-1-4, CR 2845-S-B-B-4-1-1-4, CCARI/GRS11-2-174-9, CR 4181-4-B-1, MTU 1421, MCM-144, CR 4202-286-22-1, CR 4482-1-IR16L1795, CCARI/GR9-5-163-12, CR 4285-276-6-3-1-1-1-1, Pusa 44, CN 2172-13-10-1-1, RP 6166-47-1-21-1, KR 21003, KR 21001, KR 21002, ADT 45, NVSR 788, BPT 2841, RP 6166-NPV 37-23, Improved Shri Karnal, BKR 525, BPT 3136, CSR 414-63, CR 4327-5-2-1-1, RP 6615-MK/RIL-FBMI-45-32-6, BPT 3148, KJT 23-MG-02, BPT 3344, Improved Khuddi, BPT 3263, AAU-TTB DHAN-41, BPT 3378, CSR-KR-41-4-171, NVSR 651, CR 4450-65-15-3-5-2, RP 6615-MK/RIL-FBMI-45-25-6-1, BPT 2858 and CR 4450-48-1-1-10-26-1-21-7-19.

21001 recorded resistance with disease severity less than 1 %. Additionally, 170 genotypes were categories as moderately resistant, 186 as moderately susceptible, 184 as susceptible, and 76 as highly susceptible (table 2 & 3 and graph 1).

The study was carried out to assess the response of various rice genotypes to *B. oryzae* in field condition. The present finding supported by various worker *i.e.*, Hosaouadar et al. (2021) screened rice genotype against brown spot disease out of which none of the entries found highly resistance to resistance and 32 entries *i.e.*, IET-23565, 24367, 24545, CSR 36 (Alkaline), Jaya (Yield Check), 24536, BPT 5204 (SC), 23735, 23933, 23066, CST 7-1 (CS), 24424, FL 478 Check with Saltol 1, 24777, 24319, DRRH 3 (HC), 24385, 24395, 24412,

23725, Swarna (NC), 24246, 22919, 24309, 24844, 24823, 24340, 24815, 26356, 25676, 25677, Swarna (RP), were found moderately resistant reaction to brown spot disease. Another researchers, Channakeshava et al. (2018) screen various genotype and recorded 11 genotypes *viz.*, Rasi, JGL-1798, BR-2655, Raksha, KMP-201, BI-33, Sagbatta, Honnekattu, Klame, Kavekankat and Togarshi were identified as the resistant sources against the disease as they were free from the disease throughout the cropping period, which could be used by the breeders to improve the yield of the rice crops. Arshad et al. (2008) were evaluated seventy genotypes/entries/ varieties, among that only one Basmati entry, PK-3699-43 of PARC was found resistant, while all other remaining varieties/entries

were found moderately resistant to highly susceptible. Hosagoudar et al., 2019 were evaluated 244 genotypes/entries/varieties, among that only 3 entries i.e., IET-23403, 22876 and 23392 were found resistant reaction to brown spot disease.

Conclusion

This research observed that the genotypes varied highly in the brown spot disease severity. Among 639 genotypes (National Screening Nursery 2) tested, 23 genotype was found to be resistant. 170 genotypes were found to be moderately resistance and 76 genotypes were highly susceptible. From the above research, we can conclude that the rice genotypes seem to be susceptible rather than resistant; thus, for the next-generation breeding program for brown spot resistant genotypes recommended for growing and also used in breeding program.

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