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Research Article

Screening of Local, Improved and Hybrid Rice Genotypes Against Leaf Blast Disease (*Pyricularia Oryzae*) At Bangaun, Lamahi, Dang, Nepal

Surakshya Bohora[1,2]*, Sagar Karki[1,3], Basistha Acharya[4] and Suman Bohara[4]

[1]*Institute of Agriculture and Animal Science, Tribhuvan University, Dang, Nepal*

[2]*South China Agricultural University, Guangzhou, China*

[3]*Agriculture and Forestry University, Chitwan, Nepal*

[4]*Directorate of Agricultural Research, Nepal Agricultural Research Council, Khajura, Banke, Nepal*

***Corresponding Author:** Surakshya Bohora, Institute of Agriculture and Animal Science, Tribhuvan University, Dang, Nepal and South China Agricultural University, Guangzhou, China.

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Abstract

Rice blast disease can be prevented by spraying chemicals, by a reduction in the use of excessive nitrogenous fertilizers, and by adopting biocontrol methods. The use of host resistance varieties to *P. oryzae* is reasonable and the most economical alternative and environmentally favorable way to control rice blast disease. The objective of this study was to assess the level of resistance on different rice genotypes at the seedling stage against blast disease in field conditions at Bangaun, Lamahi, Dang, Nepal.

Locally available, improved, and hybrid rice genotypes were screened at the seedling stage against rice blast disease (*Pyricularia oryzae)* at Bangaun, Lamahi, Dang, Nepal in the summer season.

The experiment was conducted in a simple randomized complete block design (RCBD) with 4 replications including 52 accessions of rice for screening. Summer sown rice accessions were scored for disease on various stage of growth based on a standard scale of 0-9 developed by IRRI at 5 days intervals starting from 20 days after sowing. Rice genotypes showed resistance to highly susceptible reactions. Mean AUDPC values varied from 36.46 to 262.13. The significantly lowest AUDPC value was obtained in Sabitri (36.46) followed by Hardinath 1(39.93), Loknath 505(48.61), and Makwanpur-1(52.08) respectively. In parallel, the highest AUDPC value was recorded in Sankharika (262.13) followed by Jumlimarshi (236.09) and Taichung dhan (197.90) respectively. The lowest disease severity was observed in Sabitri (19.44%) followed by Makwanpur-1 (22.22%) and the highest was recorded in Sankharika (80.55%) followed by Jumlimarshi (69.44%). From the study, it could be concluded that the genotypes Sabitri and Hardinath 1 could be utilized for the rice blast disease management and source for resistance breeding program. These two genotypes showed a higher level of resistance against leaf blast at the seedling stage during summer in Dang and similar field conditions in Nepal.

Keywords: Rice Blast; Pyricularia oryzae; Disease Severity

Abbreviations

a.i.: Active Ingredient; ANOVA: Analysis of Variance; AVR: Avirulence; CBS: Central Bureau of Statistics; Cm: Centimeter; CV: Coefficient of Variance; DAP: Diammonium Phosphate; DAS: Days After Sowing; DMRT: Duncan's Multiple Range Test; EC: Emulsifying Concentrate; *et al.* Et alii/alia; FYM: Farm Yard Manure; Ha: Hectare; HR: Highly Resistance; HS: Highly susceptible; IAAS: Institute of Agriculture and Animal Science; IRRI: International Rice Research Institute; LSD: Least Significant Difference; MAS: Marker-Assisted Selection; Mm: Millimeter; NARC: Nepal Agricultural Research Council; NPK: Nitrogen, Phosphorus, and Potash; QTL: Qualitative Trait Loci; r: Correlation Coefficient; R^2: Coefficient of Determination; R: Resistance; RCBD: Randomized Complete Block Design; S: Susceptible; USDA: United States Department of Agriculture.

Introduction

Various biotic and abiotic factors are responsible for the yield reduction of rice. Constraints of rice production in Nepal are plant diseases, insects, nutrient deficiency, mid-season and late-season water stress, and weeds [1] among which diseases are considered as the major constraints for higher productivity [2]. In Nepal, numerous researches have established blast as a continuous and devastating threat to rice production. Blast, caused by *Magnaporthe oryzae* [3] is the most destructive and cosmopolitan disease of rice [4].

In Nepali, the blast is locally known as "Maruwa Rog" [5]. Rice blast attacks leaf, stems, and flowers by killing plants up to tillering stage, reducing the quality of plants at maturity and yield. The disease causes complete seedling loss of susceptible rice cultivars in the dry seedbed nursery [6] and adversely affects vegetative growth and grain yield in the transplanted field [7]. Blast epidemics result in a complete loss of seedlings in the seedbed [8]. Blast disease is divided into leaf and panicle pathosystems [7]. Rice blast affects rice production in nearly all rice-growing areas and occurs in both tropical and rainfed environments of the world which are considered to be devastating with increasing nitrogenous fertilizer and higher plant density [9]. Particularly, rice blast is destructive in the temperate irrigated lowland and the tropical upland rice-growing regions due to high incidence under favorable conditions. More extended dew periods and frequent moisture stress in upland rice contribute to increasing disease incidence [4].

Generally, about 10-20% yield reduction is recorded in susceptible varieties and it can be reached up to 80% during the critical condition [10]. Rice blast disease can be managed by using tolerant and resistant varieties, applying nitrogenous fertilizer in split doses, avoiding water-stressed plants, eliminating crop residues, and application of seed treatment and use of fungicides. Host cultivars, resistant to leaf and panicle blast, are the most widely used method of disease control [11]. Effective and efficient screening techniques are keys in a successful breeding program for blast resistance. Promising varieties should also be a regular screen to check the loss of resistance due to the evolution of the virulent pathotype of the fungus [12]. In this study, attempts have been made to assess the level of resistance on different rice genotypes at the seedling stage against blast disease in field conditions at Bangaun, Lamahi, Dang, Nepal. Screening of local, improved and hybrid rice cultivar was done to identify the durable resistance cultivar of leaf blast at seedling stage.

Materials and Methods

00Experimental location

The research was conducted in the research plot of the Agronomy farm of Prithu Technical College, IAAS, Lamahi, Municipality, Dang which is located in Lumbini province of Nepal. The experimental site was situated 410 km west of Kathmandu and 2 km south of the Mahendra highway. Geographically, it is located at 27.9904' N Latitude and 82.3018' E Longitudes at the elevation of 725 masl. This location falls in the inner-terai region of the Mid-Western Development Region of Nepal.

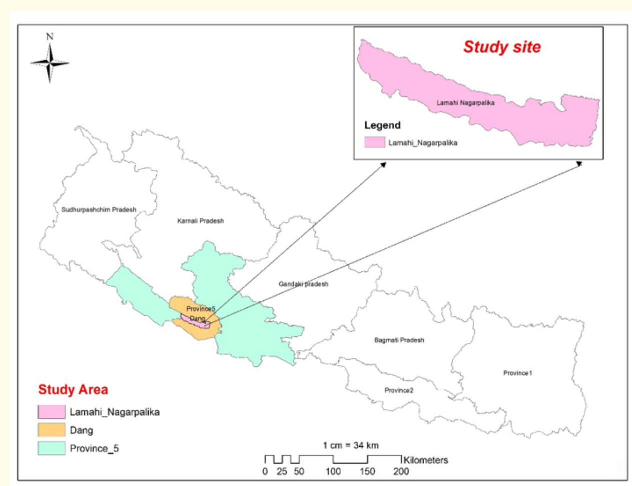

Figure 1: Experemental location.

Meteorological information

The site had a monsoon type climate and more than 75% of rainfall occurred during four months of the monsoon period (June - September). The maximum rainfall was recorded during the 1st week of July, lowest on the 3rd week of July, and no rainfall on the

2nd week of September. Similarly, temperature max was observed in July 1st week and min on 3rd week of June throughout the experimental period.

Experimental design

The experiment was conducted in a simple randomized complete block design (RCBD) with 4 replications with 52 accessions of rice for screening. For screening of rice genotypes, field layout was done. To create a blast congenial environment, the screening nursery was designed as per international specifications as described by [13] which include three types of plots. For this purpose, three types of the plot were maintained as Windbreak plot, Inoculums plot, and the test plot. The total plot size was laid 200 m^2 and individual plot size of 500 m^2, test plot and inoculums plot having 17.5*1.25 m^2 area. The distance between the windbreak plot and inoculums plot was 50 cm while between the two test plots were 30 cm.

Windbreak plot

Around the main plot dhaincha (*Sesbania aculeate*) was planted in a plot size of 1.25 m width and 20 m length for 30 days before seeding of first two lines of inoculums row to maintain higher humidity in the test blocks, to help conidial depositions, and to provide a conducive environment for blast development and also to minimize the inter plot interferences by breaking speed of the wind.

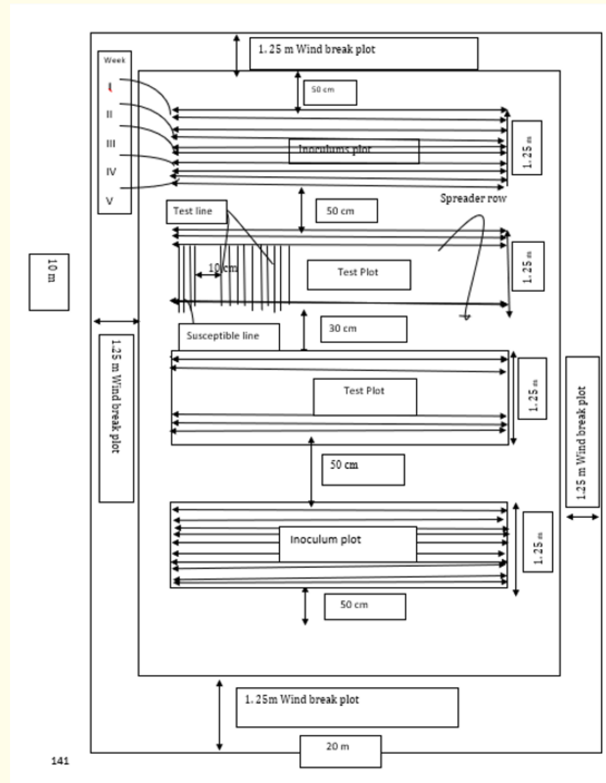

Figure 2: Field layout.

Inoculums plot

Inoculums plot was on both sides of the test plot having the size of 17.5*1.25 m. The plot was planted with a mixture of blast susceptible variety i.e. Sankharika, Mansuli and Jumli marshi on five different dates at one-week intervals. Two rows in each inoculum plot were seeded continuously at 10 cm apart along the length of the test plot with the susceptible mixture at a time.

Test plot

The two test plots were accommodated between inoculums plots and each plot was 1.25 m wide and 17.5 meters long with a spacing of 30 cm between the plots. Plots were raised 20 cm above the ground level to create the upland condition. Test entries were surrounded by three border rows of Sankharika alongside the windbreak plot, two rows at the side of the test plot, three rows at the beginning, and three rows at the end of the test plots.

Plant materials

A total of 52 rice genotypes including checks (resistant and susceptible) were sown (Table 1). Susceptible and resistant checks were sown after every 10 test entries to check uniformity of infection. The cultivar Mansuli and Sankharika were taken as susceptible check and Sabitri as a resistant check in the field. The mixtures of several susceptible cultivars (Mansuli, Sankharika, and Jumli marshi) were planted in inoculum plot and also as spreader rows on both sides of the test entries to ensure the presence of inoculum consisting of diverse races of the blast pathogen. The spreader row was used to trap the inoculum from the inoculum plot to spread the disease to the test plot therefore allowing the natural dispersal of pathogen in the test lines from the inoculum plot.

Cultural practices

The field was plowed 1-month before sowing. All the weeds and debris were cleaned and well-decomposed FYM @10 t/ha was

Treatments	Genotypes	Group
T_1	Joongay dhan	Local
T_2	Anadi dhan	Local
T_3	Majhakote dhan	Local
T_4	Dalle dhan	Local
T_5	Jethobudo dhan	Local
T_6	Ekle dhan	Local
T_7	Kalo jhiniya	Local
T_8	Macchapalan	Local
T_9	Tilki dhan	Local
T_{10}	Mota dhan	Local
T_{11}	Chote dhan	Local
T_{12}	Kathe jhinuwa	Local
T_{13}	Pokhreli dhan	Local
T_{14}	Sona mansuli	Local
T_{15}	Local Mansuli	Local
T_{16}	Jumlimarshi	Local
T_{17}	Sankharika	Local
T_{18}	Jarneli dhan	Improved
T_{19}	Hansharaj	Improved
T_{20}	Makwanpure B.G	Improved
T_{21}	Sawa sub-1	Improved
T_{22}	Khumal-4	Improved
T_{23}	Taichung dhan	Improved
T_{24}	HUA 565	Improved
T_{25}	IR-09-F434	Improved
T_{26}	IR 87615-4-3-1-3	Improved
T_{27}	Sabitri	Improved
T_{28}	IR-87754-42-2-2	Improved
T_{29}	Tox322-6-5-2-2-2-2	Improved
T_{30}	Basmati	Improved
T_{31}	Sukha-1	Improved
T_{32}	Sukha-2	Improved
T_{33}	Sukha-3	Improved
T_{34}	Sukha-4	Improved
T_{35}	Sukha-5	Improved
T_{36}	Radha 4	Improved
T_{37}	Radha 11	Improved
T_{38}	Ghaiya 1	Improved
T_{39}	Hardinath 1	Improved
T_{40}	Makwanpur-1	Improved
T_{41}	Swarna sub-1	Improved
T_{42}	Masuli	Improved
T_{43}	Hardinath-2	Improved
T_{44}	Black rice	Improved
T_{45}	Ram dhan	Improved
T_{46}	Ceherang sub-1	Improved
T_{47}	Sukha-6	Improved
T_{48}	Champion	Hybrid
T_{49}	US 312	Hybrid
T_{50}	Taragold 1112	Hybrid
T_{51}	Aakash	Hybrid
T_{52}	Loknath 505	Hybrid
	Sabitri	Resistance check
	Sankharika	Susceptible check
	Jumlimarshi	Susceptible check

Table 1: Genotypes details used in the research.

mixed into soil two weeks before dhaincha sowing. The bed was raised 15 cm and the soil was well pulverized and leveled. Chemical fertilizers were applied @120:40:0 kg NPK/ha through urea and diammonium phosphate respectively. A heavy dose of nitrogen and no potash was used to ensure adequate infection. Half dose of nitrogen and a full dose of phosphorus was applied as a basal dose at the time of final land preparation and the remaining half nitrogen was applied at two split doses: one fourth at 15 days after sowing (DAS) and the remaining one fourth at 25 DAS.

Disease scoring and data collection

The disease data were recorded from plants/plot based on a 1-9 scoring scale [14]. Plants were randomly selected from the row of each replication and scoring was recorded from a 1-9 scoring scale based on symptoms observed as shown in Figure 3. The scoring was recorded five times at five days intervals. AUDPC value and disease severity were recorded for determining disease infestation.

As shown in the disease scoring chart, the score 0 was considered as highly resistant reaction whereas 1 was resistant, 2-5 moderately resistant, 6-7 as susceptible, and 8-9 were considered highly susceptible. Based on the scored value from the estimation

$$\text{Disease severity \%} = \frac{\text{Sum of all disease rating}}{\text{No. of plants observed} \times 9} \times 100$$

Scale	Description	Host Behavior
0	No lesion	Highly resistance
1	Small brown specks of pinhead size	Resistance
2	Small roundish to slightly elongated, necrotic gray spots, about 1-2mm in diameter, with a distinct round margin. Lesions are mostly found in lower leaves.	Moderately resistance
3	Small, roundish to slightly elongated, necrotic grey spots about 1-2 mm in diameter with brown margin, but significant mostly in the upper leaves.	Moderately resistance
4	Typical susceptible blast lesions, 3mm or longer infecting less than 4% of leaf area	Moderately susceptible
5	Typical blast lesions of 3mm or longer infecting less than 4-10% of the leaf area	Moderately susceptible
6	Typical blast lesions of 3mm or longer infecting 11-25% of the leaf area	Susceptible
7	Typical blast lesions of 3 mm or longer infecting 26-50% of the leaf area	Susceptible
8	Typical blast lesions of 3 infecting less than 51-75% of the leaf area and many leaves dead	Highly susceptible
9	Typical susceptible blast lesion of 3 mm or longer infecting more than 75% of leaf area.	Highly susceptible

Table 2: Disease scoring scale according to a standard scale developed by IRRI (1996).

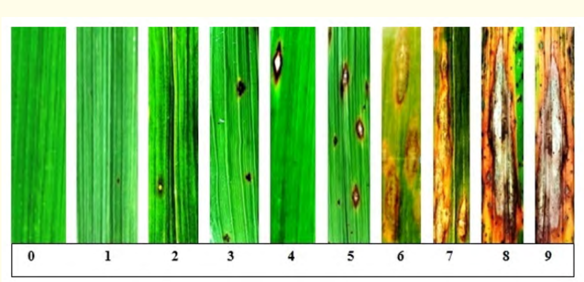

Figure 3: Disease scoring chart from the scale of 0 to 9. Source: (Acharya., *et al*).

of the leaf area infection the severity % was calculated per plot by using the following formula:

The effect of disease severity on rice variety was integrated into the area under the disease progress curve (AUDPC) for the quantitative measure of epidemic development, disease severity, and rate of progress which has no unit. AUDPC values were computed, from leaf blast severity (Das., *et al*. 1992).

$$\text{AUDPC}=\sum_{i=1}^{n-1}\left[\frac{(x_{i+1}+x_i)}{2}\right]\times(t_{i+1}-\text{ti})$$

Where,

x_i= leaf blast disease severity on ith date

t_i= date from sowing up to date of disease score

n= number of dates on which disease was recorded.

The genotypes were categorized into five categories based on the AUDPC.

Mean AUDPC	Category	Symbol
>180	Highly susceptible	HS
170-180	Susceptible	S
140-170	Moderately susceptible	MS
70-140	Moderately resistant	MR
0-70	Resistant	R

Table 3: Resistant and susceptible categories of genotypes based on mean AUDPC value.

Disease severity %	Category	Symbol
0-20	Resistance	R
20-40	Moderately Resistance	MR
40-60	Moderately susceptible	MS
60-80	Susceptible	S

Table 4: Resistance and susceptible categories of genotypes based on Disease severity %.

Statistical analysis

The recorded data were tabulated in an excel datasheet and subjected to analysis by using the reference of Gomez and Gomez [15]. The treatment were compared using Duncan's Multiple Range Test (DMRT). The data were processed to fit into R-studio and analysis was conducted using R 3.4.1 (R Core Team, 2017) and the Agricola version 1.1-8 package (Mendiburu, 2014). Based on the ANOVA result, Duncan's multiple range test (DMRT) was performed to compare the genotypes. All the figures and graphs were prepared by using Ms-excel.

Results

Disease severity

Mean severity% value laid between 19.44 % - 80.55%. 2 genotypes viz. Sabitri and Hardinath were found most resistant to disease severity. Similarly, 16 genotypes Makwanpur-1, Loknath 505, Aakash, Radha-4, Sukha-5, IR-87754-42-2-2, US 312, IR-09F434, Radha-11, Champion, Sukha-3, Sukha-1, Sukha-4, TOX322-6-5-2-2-2-2, Sukha-2 and Basmati were moderately resistant. Similarly, 29 genotypes viz Masuli, Ram dhan, Sona mansuli, Local mansuli, Basmati, HUA 565, Swarna sub-1 followed by varieties (Table 5) were moderately susceptible. Five genotypes viz Hansaraj, Black rice, Taichung dhan, Jumlimarsi, and Sankharika were susceptible.

The area under disease progressive curve (AUDPC)

The rice genotypes varied significantly in mean AUDPC values at 20, 25, 30, 35, and 45 days after sowing (DAS). The AUDPC values increased with time in most of all the genotypes. The mean AUDPC value ranged from 36.46 to 262.13 among the genotypes. Based on the mean AUDPC value, rice genotypes were listed on the five categories from resistance to highly susceptible (Table 3). The variety with less AUDPC was categorized as most resistant while with highest AUDPC was most susceptible. Of the total 52 rice genotypes screened in a nursery, based on AUDPC value none of the genotypes was immune or highly resistant to the disease. However, 8 genotypes viz. Sabitri, Hardinath 1, Loknath 505, Makwanpur-1, Aakash, Sukha 5, US 312, Radha-4 were found resistant. Similarly, 12 genotypes viz Sukha-1, Sukha-3, IR-87754-42-2-2, IR09F434, Champion followed by varieties (Table 6) were moderately resistant. Similarly, 24 genotypes viz Local Mansuli, Masuli, Black rice, Ram dhan, Khumal-4, Jernali dhan followed by varieties (Table 6) were moderately susceptible to leaf blast and 5 genotypes viz. Jarneli dhan, Ekle dhan, Jethobudo dhan, Hansaraj, Sawa sub-1 were susceptible and 3 genotypes viz. Sankharika, Jumli marshi, and Taichung were highly susceptible to leaf blast.

Genotypes	Disease severity (%)	Reaction
Sankharika	80.55^{a}	HS
Jumlimarsi	69.44^{b}	S
Taichung dhan	63.88^{bc}	S
Black rice	61.11^{bcd}	S
Hansaraj	61.11^{bcd}	S
Ceherang sub -1	58.33^{cde}	MS
IR87615-4-3-1-3	58.33^{cde}	MS
Jarneli dhan	58.33^{cde}	MS
Ram dhan	58.33^{cde}	MS
Sukha-6	58.33^{cde}	MS
Ekle dhan	55.55^{cdef}	MS
Ghaiya 1	55.55^{cdef}	MS
Majhakote dhan	55.55^{cdef}	MS
Masuli	55.55^{cdef}	MS
Sawa sub-1	55.55^{cdef}	MS
Anadi dhan	52.77^{defg}	MS
Jethobudo dhan	52.77^{defg}	MS
Dalle dhan	50.00^{efg}	MS
Kalo jhiniya	50.00^{efgh}	MS
Khumal-4	50.00^{efgh}	MS
Local mansuli	50.00^{efgh}	MS
Mota dhan	50.00^{efgh}	MS
Joongay dhan	47.22^{fghi}	MS
Macchapalan	47.22^{fghi}	MS
Makwanpure B.G dhan	47.22^{fghi}	MS
Sona mansuli	47.22^{fghi}	MS
Tara gold 1112	47.22^{fghi}	MS
Tilki dhan	47.22^{fghi}	MS
Chote dhan	47.21^{fghi}	MS
Kathe jhinuwa	47.21^{fghi}	MS
Pokhreli dhan	44.44^{ghij}	MS
Swarna sub-1	44.44^{ghij}	MS
Hardinath-2	41.66^{hijk}	MS
HUA 565	41.66^{hijk}	MS
Basmati	38.89^{ijkl}	MR
Sukha-2	36.11^{jklm}	MR
Sukha-4	36.11^{jklm}	MR
TOX322-6-5-2-2-2-2	34.33^{lkmn}	MR
Sukha-1	33.33^{klmn}	MR

Sukha-3	33.33^{klmn}	MR
Champion	33.33^{klmn}	MR
Radha-11	33.33^{klmn}	MR
IR-09F434	30.55^{lmno}	MR
US 312	30.55^{lmno}	MR
IR-87754-42-2-2	27.78^{mnop}	MR
Sukha-5	27.78^{mnop}	MR
Radha-4	25.00^{mnop}	MR
Aakash	22.22^{nop}	MR
Loknath 505	22.22^{op}	MR
Makwanpur-1	22.22^{op}	MR
Hardinath 1	19.44^{p}	R
Sabitri	19.44^{p}	R
CV	15.79	
Mean	44.93	
LSD	9.91	
P value	<2e-16***	
SE±	3.54	

Table 5: Resistant and susceptible categories of 52 rice genotypes based on disease severity % of Pyricularia oryzae at Bangaun, Lamahi, Dang.

CV= Coefficient of variation, LSD= Least Significant Difference*** Highly Significant at 5% level

Genotypes	Mean AUDPC	Reaction
Sankharika	262.13^{a}	HS
Jumlimarsi	236.09^{a}	HS
Taichung dhan	197.90^{b}	HS
Sawa sub-1	178.80^{bc}	S
Hansaraj	177.07^{bcd}	S
Jethobudo dhan	177.07^{bcd}	S
Ekle dhan	175.33^{bcde}	S
Jarneli dhan	175.33^{bcde}	S
Ceherang sub -1	164.92^{cdef}	MS
Khumal-4	164.92^{cdef}	MS
Makwanpure B.G dhan	161.45^{cdef}	MS
Anadi dhan	161.44^{cdefg}	MS
Masuli	161.44^{cdefg}	MS
Macchapalan	159.71^{cdefg}	MS
Sukha-6	159.71^{cdefg}	MS
Ram dhan	159.71^{cdefgh}	MS
Majhakote dhan	157.97^{cdefgh}	MS
Black rice	157.97^{cdefgh}	MS
TOX322-6-5-2-2-2-2	156.86^{cdefgh}	MS
Mota dhan	156.2^{cdefgh}	MS
Sona mansuli	154.50^{cdefgh}	MS
IR87615-4-3-1-3	154.50^{cdefgh}	MS
Kalo jhiniya	154.50^{cdefgh}	MS
Dalle dhan	152.76^{cdefgh}	MS
Joongay dhan	152.76^{cdefgh}	MS
Local mansuli	152.76^{cdefgh}	MS
Tara gold 1112	149.29^{defgh}	MS
Ghaiya 1	149.29^{defgh}	MS
Chote dhan	147.55^{efghi}	MS
Kathe jhinuwa	147.55^{efghi}	MS
Tilki dhan	145.82^{fghij}	MS
Pokhreli dhan	145.82^{fghij}	MS
Hardinath-2	140.61^{fghij}	MR
Swarna sub-1	138.88^{fghij}	MR
Basmati	135.40^{ghij}	MR
Sukha-2	133.67^{ghij}	MR
HUA 565	130.20^{hij}	MR
Sukha-4	119.78^{ij}	MR
Radha-11	118.05^{jk}	MR
Champion	90.27^{kl}	MR
IR-09F434	88.54^{l}	MR
IR-87754-42-2-2	83.33^{lm}	MR
Sukha-3	79.85^{lmn}	MR
Sukha-1	72.91l^{mno}	MR
Radha-4	64.23^{lmnop}	R
US 312	64.23^{mnop}	R
Sukha-5	59.02^{mnop}	R
Aakash	55.55^{mnop}	R
Makwanpur-1	52.08^{nop}	R
Loknath 505	48.61^{op}	R
Hardinath 1	39.93^{p}	R
Sabitri	36.46^{p}	R
Cv%	14.71	
Mean	135.71	
LSD	27.91	
P value	<2e-16***	
SE±	9.99	

Table 6: Resistant and susceptible categories of rice genotypes based on mean AUDPC of *Pyricularia oryzae* at Bangaun, Lamahi, Dang during.

AUDPC; Area under disease progress curve, CV= Coefficient of variation, LSD= Least Significant Difference ***Highly Significant at 5% level.

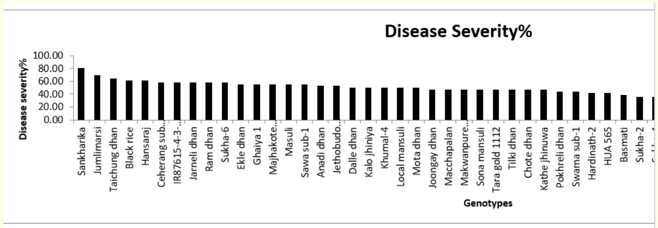

Figure 4: Graphical representation of disease severity scoring at Bangaun, Dang, Nepal.

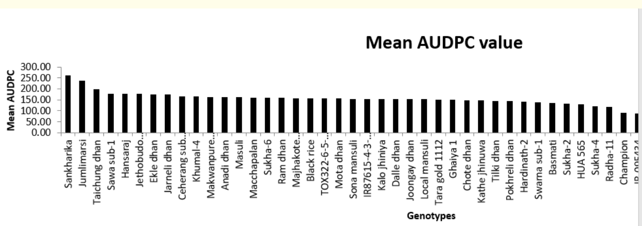

Figure 5: Graphical representation of mean AUDPC at different dates of scoring at Bangaun, Dang, Nepal.

Discussion

The adverse environmental condition as low rainfall and relative humidity at early stage check disease development while optimum rain and sufficient humidity at late growth stages cause higher disease infection. Sankharika, Taichung -176, and Pusa basmati were most susceptible, and Radha-4 and Sabitri were most resistant. A similar result was also found as Taichung-176 for mid-hills and Sankharika for terai to be most susceptible and Sabitri to be the most resistant variety [9]. Similarly [8], also found that Sabitri and Radha varieties were resistant to blast pathogen whereas Taichung-176, Pusa basmati, and Sankharika were categorized as the most susceptible varieties.

Similarly [9], again found Masuli_MT4 lines as most susceptible to both leaf and neck blasts. The lowest disease severity % was observed in Sabitri whereas Sankarika showed the highest disease severity % during all days of disease observation. Different genotypes showed different levels of blast resistance. The area under disease progress curve (AUDPC) differed along with rice lines and varied level of yield was reported in different rice genotypes [16]. The temperature changes had significant effects on blast development but no simple effect on AUDPC [17]. Thus, the variation in an environmental condition also changed the disease reaction.

Summary and Conclusion

Series of experiments were undertaken for the management of the above-mentioned disease under field conditions at Bangaun, Lamahi, Dang, Nepal. While comparing 52 rice genotypes of rice in Randomized Complete Block Design under field condition in seedling stage to identify the resistance and susceptible variety among different rice genotypes we found a high level of host resistance among the genotypes. Disease severity varied according to rice lines. The genotypes used were highly significant in AUDPC and leaf blast severity. From this experiment, we could conclude that the genotypes Sabitri and Hardinath 1 could be utilized as a source of resistance for the breeding of rice for leaf blast disease resistance. The genotypes have a higher level of resistance against rice leaf blast at the seedling stage during summer in Dang and similar field conditions in Nepal.

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