Screening of Maize Genotypes against Southern Leaf Blight (Bipolaris Maydis) during summer in Rampur, Chitwan

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Abstract**—** *Screening of 20 maize genotypes against Southern Leaf Blight of maize (Bipolaris maydis (Nisik) Shoemaker) was carried out in RCBD in National Maize Research Program, Rampur, Nepal during June to September, 2015. The area of research field was 315 m^2. Each genotype had two rows per plot of 7.5m^2 with two replication. Disease incidence was taken for three times at 43, 53 and 63 DAS. Disease scoring was done as percentage of leaf area infected on individual plant at 7 days interval starting from 58 days after sowing for 5 times and disease severity and mean AUDPC was calculated. Also the yield was calculated. Shade house experiment was carried out in a Completely Randomized Design with 3 replication on 20 genotypes by artificial inoculation at 3-4 leaf stage with a pure culture suspension of Bipolaris maydis (4x10^4conidia per ml) .and disease incidence and survival days of plant were recorded. Among the genotypes disease severity varied in the field. Highly significant differences were observed among the genotypes for Southern Leaf Blight severity, Area Under Disease Progress Curve and grain yield. Genotypes with mean AUDPC values from 200-250, 250-300 and above 300 were categorized as moderately resistant, moderately susceptible and susceptible. Disease severity was highest on genotype Rampur 24, 07 SADVI and lowest on BGBYPOP, RML-32/RM-17 and RAMS03F08. Highest maize yield (4.44 ton/ha) was recorded on RML-32/RML-17 and least (1.41 ton/ha) was obtained in ZM-627.In shade house, Rampur-24 followed by 07 SADVI, Rampur 27 died earlier and RML-32/RML-17 and BGBYPOP survived to the longest periods after inoculation. Disease Susceptibility pattern was similar in both field and shade house condition. The genotypes RML-32/RML-17, BGBYPOP, RAMS03F08 and TLBRS07F16 could be developed as resistant varieties to Southern Leaf Blight of maize and also as high yielders during summer under Chitwan and similar conditions.*

Keywords— AUDPC, Bipolaris maydis, disease scoring, inoculation, resistant.

I. INTRODUCTION

Maize (*Zea mays* L.) is one of the most important cereal crops of the world grown in the irrigated and rainfed areas which ranks third after wheat and rice. Due to its high potentiality than any other cereals, it is also called as a versatile and miracle crop so it is popularly known as' Queen of Cereals'(Singh, 2002).It is the second most important crop after rice in terms of area and production and productivity (2.46 ton/ha) in Nepal. There is a wide gap between potential yield of maize varieties having 6.7 t/ha (on-station experimental yield), attainable yield of about 5.7 t/ha (on farm yield with improved practices) and national yield of 2.4 t/ha [1]. Among many,the most important factor for causing this wide gap in yield is SLB of maize caused by *B.maydis* syn. *Helminthosporium maydis (Teliomorph: Cochliobolous heterostrophus*).This disease was identified in 1965 from Rampur, Chitwan for the first time in Nepal [6].There are three physiological races of *C.heterostrophus*, they are Race O, T and C. The most prevalent race is O which attacks a broad range of genotypes. In maize, one recessive major gene for resistance has been identified namely rhm 1 which confers resistance to race O of *C. heterostrophus* [3,12].In the adult plant rhm 1 confers a level of quantitative resistance[2,11].Disease data in experimental trail and disease situation in farmer's field support the need for screening the genotypes against SLB [8].The use of fungicides is costly and environment unfriendly and it is simple, effective, safe and economical to use resistant varieties for controlling this disease. In such contest, identification of resistant genotypes/varieties would be good alternatives to manage SLB. The study was conducted with following objectives

- To determine the SLB disease incidence and disease severity of maize in field under epiphytotic condition.
- To determine the seedling incidence of SLB disease under shade house condition.
- To identify resistant and susceptible genotypes of maize against SLB disease

II. MATERIAL AND METHOD

2.1 Field Experiment

Field experiment was conducted at National Maize Research Program (NMRP), Rampur, Chitwan, Nepal during summer season (June to September, 2015) under rainfed condition and shade house and lab work were conducted atInstitue of Agriculture and Animal Science (IAAS), Rampur, Chitwan The experiment was conducted in a randomized completely block design with 2 replications. Individual plot size was 1.25 m^2 (5m x 0.25m) and the area of research field was 315m^2. There were 2 rows of 5m length/plot and 75cm apart. The susceptible check farmer's local was sown on the border of both side of field to provide uniform source of inoculum to the maize plants.Analysis of variance (ANOVA) was used to test differences among the treatments and means were separated using Duncan's multiple range test (DMRT) at the 5% level of significance [5].

2.1.1 Disease assessment

Disease incidence was taken 43, 53 and 63 DAS.

2.1.2 Disease scoring

Disease scoring was started 58 days after sowing. Southern leaf blight severity was measured as percentage of leaf area infected on individual plant visually at 7 days intervals. A total of 5 scorings were done from June to August, 2015, i.e. 58DAS, 65DAS, 72DAS, 79DAS and 86DAS. Disease scoring was done on 1 – 5(CIMMYT scale) as below.

1 = Plants with one or two to few scattered lesions on lower leaves (Resistant)

2 = Moderate number of lesions on leaves, affecting <25% of the leaf area (Moderately Resistant)

3 = Abundant lesions on lower leaves, few on other leaves affecting 26-50%

leaf area (Moderately Susceptible)

4 = Lesions abundant on lower and mid leaves, extending to upper leaves

affecting 75% leaf area (Susceptible)

5 = Lesions abundant on almost all leaves, plants prematurely dried or killed with

76-100% of the leaf area affected (Highly Susceptible)

Percent disease severity was calculated using the following formula:

$$Disease\ severity(\%)\ \frac{\text{Sum of all numerical ratings} \times 100}{\text{Total number of plants observed} \times \text{maximum rating}}$$

Disease severity was calculated/plant and mean severity was computed/plot. AUDPC value was calculated by using the following formula as given by Das *et al.*(1992).

$$AUDPC = \sum_{i=1}^{n-1} [\{(Y_i + Y_{i+1})/2\} \times (t_{(i+1)} - t_i)]$$

where, Y_i = disease severity on the i^{th} date, t_i = time on which Y_i was recorded and n = number of times observations were taken. Based on mean AUDPC value, genotypes were categorized into 3 resistance level.

Mean AUDPC value	Resistance category	Code
>300	Susceptible	S
250-300	Moderately susceptible	MS
200-250	Moderately resistant	MR

2.2 Shade house experiment

For the verification of field experiment, a greenhouse study was done. Maize leaves with typical symptoms of southern leaf blight from border plant were collected from the field and pathogen was isolated to prepare pure culture for artificial

inoculation. Maize seedlings were inoculated with suspension of *B. maydis* (4×10^4conidia/ml) on 16 October 2015,12days after sowing, with the help of a hand atomizer. Disease incidence was observed 2 days after inoculation.

2.3 Statistical analysis

ANOVA and DMRT was done by using statistical software R-STAT, correlation analysis was done using MS-EXCEL 2010 and covariance analysis was done using GEN-STAT.

III. RESULT AND DISCUSSION

Twenty maize genotypes varied considerably in incidence of SLB disease at 43, 53 and 63 DAS. Disease incidence at 43 DAS was found highest in ZM 627(76.33^{a}±6.94) which was at par with P501RCO/P502RCO, ZM401 and AC9942/AC9944and, the lowest disease incidence was seen in RAMS03S08 (12.60^{g}±4.97) which was at par with BGBYPOP, RAMPUR 33, and RML32/RML17 and the result obtained in 53 DAS and 63 DAS was found non-significant. The disease severity on 79 DAS was highest in 07 SADVI (66.00^{a}±11.31) which was at par with RAMPUR 24, 05 SADVI and ZM401 and disease severity was found minimum in BGBYPOP (37^{e}±9.89) which was at par with RAMS03F08, TLBRSO7F16, and RML32/RML17.In susceptible check F. LOCAL moderate severity (46^{bcde}±0.00) was seen. In our research lowest disease severity was shown by RML32/RML-17 which was supported by Magar(2012) with severity 7.27.

TABLE 1
SLB DISEASE SEVERITY OF 20 MAIZE GENOTYPES AT RAMPUR, CHITWAN, DURING JUNE TO AUGUST 2015

Genotypes	58 DAS	65 DAS	72DAS	79 DAS	86 DAS
RAMPUR-24	28^{ab}±2.82	43±18.38	55^{a}±4.24	66^{a}±5.65	80±11.31
07 SADVI	26^{abc}±0.00	36±14.14	50^{ab}±5.65	66^{a}±11.31	81±12.72
RAMPUR-28	31^{a}±7.07	37±4.24	53^{a}±9.89	56^{abc}±5.65	62±5.65
RAMPUR-27	27^{abc}±4.24	39±9.89	49^{ab}±1.41	55^{abcd}±1.41	61±1.41
05 SADVI	26^{abc}±0.00	36±14.14	50^{ab}±5.65	66^{a}±11.31	81±12.72
ZM-401	28^{ab}±5.65	36±16.97	41^{abcd}±18.38	55^{abcd}±7.07	69±7.07
AC9942/AC9944	25^{abc}±4.24	33±4.24	44^{abcd}±2.82	55^{abcd}±1.41	69±1.41
ZM-627	21^{bc}±1.41	35±15.55	45^{abcd}±12.72	54^{abcd}±8.48	68±11.31
P501SRCO/P502SRCO	21^{bc}±1.41	33±7.07	44^{abcd}±2.82	52^{abcd}±2.82	64±11.31
RAMPUR-32	24^{abc}±0.00	35±1.41	45^{abcd}±15.55	50^{bcde}±5.65	57±9.89
RAMPUR-36	21^{bc}±1.41	32±5.65	39^{abcd}±1.41	55^{abcd}±7.07	68±0.00
RAMPUR-34	21^{bc}±1.41	34±2.82	47^{abc}±4.24	50^{bcde}±5.65	57±7.07
RAMPUR-33	22^{bc}±0.00	33±7.07	40^{abcd}±2.82	49^{bcde}±4.24	62±5.65
RAMPUR-21	22^{bc}±2.82	31±4.24	42^{abcd}±2.82	50^{bcde}±2.82	56±8.48
F.LOCAL	22^{bc}±2.82	31±4.24	36^{abcd}±5.65	46^{bcde}±0.00	55±4.24
RAMPUR COMP	22^{bc}±0.00	29±1.41	36^{abcd}±5.65	42^{bcde}±2.82	51±4.24
TLBRS07F16	21^{bc}±1.41	24±5.65	26^{d}±2.82	41^{cde}±1.41	65±32.52
RAMS03F08	21^{bc}±1.41	26±2.82	32^{bcd}±2.82	40^{de}±14.14	50±28.28
RML-32/RML-17	20^{c}±0.00	27±7.07	29^{cd}±7.07	41^{cde}±4.24	44±2.82
BGBYPOP	21^{bc}±1.41	24±2.82	26^{d}±5.65	37^{e}±9.89	44±5.65
LSD	6.03*	NS	16.11*	13.56**	NS
CV (%)	12.25	21.61	18.70	12.74	16.99
Grand mean	23.50	32.60	41.15	50.85	61.8

DAS: Days after sowing, CV: Coefficient of variation, LSD: Least significant difference: Means followed by the same letter in a column are not significantly different by DMRT at 5% level of significance, Sd (±) represents standard deviation, **:Highly significant, *: Significant, NS: Non significant

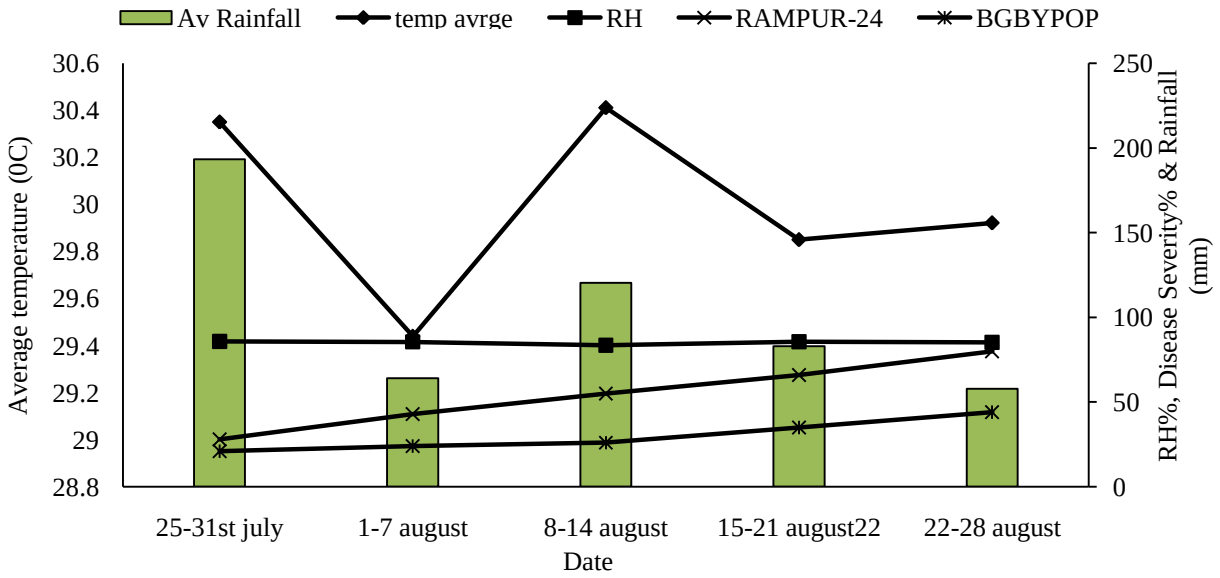

FIGURE 1. METEOROLOGICAL FACTORS AND DISEASE SEVERITY OF RAMPUR-24 AND BGYPOP

TABLE 2
AUDPC VALUES OF SLB ON 20 MAIZE GENOTYPES IN FIELD AT RAMPUR, CHITWAN, JUNE TO AUGUST 2015

Genotypes	AUDPC1 (58 DAS)	AUDPC2 (65DAS)	AUDPC3 (72DAS)	AUDPC4 (79DAS)	Total AUDPC
RAMPUR-24	248.5±54.44	343.0±79.19	423.5^{a}±34.64	511.0^{ab}±59.39	1526.0^{a}±227.68
07 SADVI	217.0±49.49	301.0±69.29	406.0^{ab}±19.79	514.5^{a}±84.14	1438.5^{ab}±14.84
RAMPUR-28	238.0±9.89	315.0±19.79	381.5^{abc}±54.44	413.0^{abcde}±39.59	1347.5^{abc}±123.74
RAMPUR-27	231.0±19.79	308.0±39.59	364.0^{abcd}±0.00	406.0^{abcdef}±9.89	1309.0^{abcd}±79.19
05 SADVI	217.0±39.59	273.0±49.49	353.5^{abcde}±4.94	455.0^{abc}±59.39	1291.5^{abcd}±34.64
ZM-401	224.0±79.19	269.5±123.74	$336.0^{abcdefg}$±89.09	434.0^{abcd}±0.00	1263.5^{abcde}±292.03
AC9942/AC9944	203.0±0.00	269.5±4.94	346.5^{abcdef}±4.94	434.0^{abcd}±0.00	1253.0^{abcde}±0.00
ZM-627	196.0±49.49	280.0±98.99	346.5^{abcdef}±74.24	427.0^{abcd}±9.89	1249.5^{abcde}±212.83
P501SRCO/P502SRCO	189.0±19.79	269.5±34.64	$336.0^{abcdefg}$±19.79	406.0^{abcdef}±29.69	1200^{abcdef}±44.54
RAMPUR-32	206.5±4.94	280.0±59.39	332.5^{abcdef}±74.24	374.5^{cdef}±54.44	1193.5^{abcdef}±193.04
RAMPUR-36	185.5±14.84	248.5±14.84	$329.0^{abcdefg}$±29.69	430.5^{abcd}±24.74	1193.5^{abcdef}±24.74
RAMPUR-34	192.5±14.84	283.5±4.94	339.5^{abcdef}±34.64	374.5^{cdef}±44.54	1190.0abcdef±69.29
RAMPUR-33	192.5± 24.74	255.5±34.64	$311.5^{bcdefgh}$±24.74	388.5^{bcdef}±34.64	1148.0^{bcdefg}±118.79
RAMPUR-21	185.5±24.74	255.5±24.74	$322.0^{abcdefgh}$±19.79	371.0^{cdef}±39.59	1134.0^{bcdefg}±108.89
F.LOCAL	185.5±4.94	234.5±34.64	287.0^{cdefgh}±19.79	353.5^{cdef}±14.84	1060.5^{cdefg}±44.54
RAMPUR COMP	178.5±4.94	227.5±24.74	273.0^{defgh}±29.69	325.5^{def}±24.74	1004.5^{defg}±84.14
TLBRS07F16	157.5±24.74	175.0±29.69	234.5^{gh}±14.84	371.0^{cdef}±108.89	938.0^{efg}±39.59
RAMS03F08	164.5±14.84	203.0±19.19	252.0^{efgh}±59.39	315.0^{def}±148.49	934.5^{efg}±242.53
RML-32/RML-17	164.5±24.74	196.0±49.49	245.0^{fgh}±9.89	297.5^{ef}±24.74	903.0^{fg}±59.39
BGBYPOP	157.5±4.94	175.0±29.69	220.5^{h}±54.44	283.5^{f}±54.44	836.5^{g}±143.54
LSD	NS	NS	90.00259**	107.2892*	290.578**
CV (%)	14.71	18.66	13.35	13.00	11.85
Grand Mean	196.35	258.125	322	394.275	1170.75

DAS: Days after sowing, CV: Coefficient of variation, LSD: Least significant difference: Means followed by the same letter in a column are not significantly different by DMRT at 5% level of significance, Sd (±) represents standard deviation, **:Highly significant, *: Significant, NS: Non significant

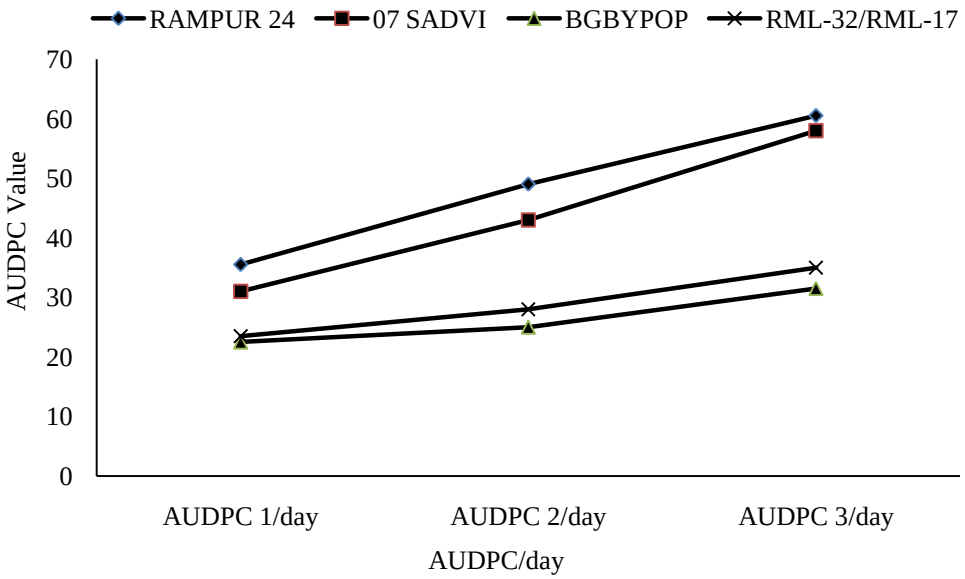

FIGURE 2. AUDPC VALUE OF DIFFERENT GENOTYPES

3.1 Area under disease progress curve (AUDPC)

The AUDPC1, AUDPC2, AUDPC3, AUDPC4 and total AUDPC were computed for all the genotypes expressing the disease severity (Table 3). The AUDPC1 58 days after sowing were found non-significant. Similarly, AUDPC2 also found non-significant. The AUDPC3 72 days after sowing was found to be highly significant. The genotype BGBYPOP had the lowest AUDPC which was at par with TLBRS07F16, RML-32/RML-17 and RAMS03F08 and highest AUDPC3 was found in RAMPUR-24 which was at par with 07SADVI, RAMPUR-28, RAMPUR-27.The AUDPC4 was found lowest in the genotype BGBYPOP which was at par with RML-32/RML-17, RAMS03F08 and the highest AUDPC was found in the genotype 07 SADVI which was at par with RAMPUR-24, 05 SADVI.

TABLE 3

RESISTANCE CATEGORY OF 20 MAIZE GENOTYPES ON THE BASIS OF MEAN AUDPC AND AUDPC PER DAY VALUES IN FIELD AT RAMPUR, CHITWAN, DURING JUNE TO AUGUST, 2015

Genotypes	Mean AUDPC	AUDPC per Day	Resistance category	Number of genotypes
RAMPUR-24	381.5^{a}±56.92	54.50^{a}±8.13	S	9
07 SADVI	359.62^{ab}±3.71	51.37^{ab}±0.53	S	
RAMPUR-28	336.87^{abc}±30.93	48.12^{abc}±4.41	S	
RAMPUR-27	327.25^{abcd}±19.79	46.75^{abcd}±2.82	S	
05 SADVI	322.87^{abcd}±8.66	46.12^{abcd}±1.23	S	
ZM-401	315.87^{abcde}±73.00	45.12^{abcde}±10.42	S	
AC9942/AC9944	313.25^{abcde}±0.00	44.75^{abcde}±0.00	S	
ZM-627	312.37^{abcde}±53.20	44.62^{abcde}±7.60	S	
P501SRCO/P502SRCO	300.12^{abcdef}±11.13	42.87^{abcdef}±1.59	S	
RAMPUR-32	298.37^{abcdef}±48.26	42.62^{abcdef}±6.89	MS	7
RAMPUR-36	298.37^{abcdef}±6.18	42.62^{abcdef}±0.88	MS	
RAMPUR-34	297.50^{abcdef}±17.32	42.50^{abcdef}±2.47	MS	
RAMPUR-33	287.00^{bcdefg}±29.69	41.00^{bcdefg}±4.24	MS	
RAMPUR-21	283.50^{bcdefg}±27.22	40.50^{bcdefg}±3.88	MS	
F.LOCAL	265.12^{cdefg}±11.13	37.87^{cdefg}±1.59	MS	
RAMPUR COMP	251.12^{defg}±21.03	35.87^{defg}±3.00	MS	
TLBRS07F16	234.50^{efg}±9.89	33.50^{efg}±1.41	MR	4
RAMS03F08	233.62^{efg}±60.63	33.37^{efg}±8.66	MR	
RML-32/RML-17	225.75^{fg}±14.84	32.25^{fg}±2.12	MR	
BGBYPOP	209.12^{g}±35.88	29.87^{g}±5.12	MR	
LSD	72.63**	10.375**		
CV (%)	11.85	11.85		
Grand Mean	292.68	41.8125		

The genotype RAMPUR-24 had the highest total AUDPC which was at par with 07SADVI, RAMPUR-28 and the lowest total AUDPC was obtained in the genotype BGBYPOP which was at par with RML-32/RML-17, RAMS03F08.

3.2 Categorization of genotypes based on mean AUDPC

The mean AUDPC value ranged from (209.12±35.88) to (381.5±56.92) (Table 4) which differ highly significantly from each other. The genotype BGBYPOP had the lowest AUDPC which was at par with RML-32/RML-17 and RAMPUR 24 had the highest mean AUDPC which was at par with 07SADVI. Similar observations were found for AUDPC per day values. The genotypes RML-32/RML-17 (32.25±2.12), RAMS03F08 (33.37±8.66) did not differ significantly from BGBYPOP (29.87±5.12).

TABLE 4
MEAN YIELD DATA OF 20 MAIZE GENOTYPES AT RAMPUR, CHITWAN, 2015

Genotypes	Yield (t/ha)	Yield after covariance analysis
RAMPUR-24	1.59^{d}±0.51	2.109^{cde}±0.51
07 SADVI	2.23^{bcd}±0.14	2.058^{cde}±0.14
RAMPUR-28	3.80^{ab}±1.97	3.682^{ab}±1.97
RAMPUR-27	3.55^{ab}±0.49	3.089^{bcd}±0.49
05 SADVI	2.69^{abcd}±0.07	2.690^{bcde}±0.07
ZM-401	2.25^{bcd}±0.86	2.481^{bcde}±0.86
AC9942/AC9944	2.61^{abcd}±0.79	2.610^{bcde}±0.79
ZM-627	1.41^{d}±0.13	1.987^{cde}±0.13
P501SRCO/P502SRCO	2.06^{bcd}±0.09	1.660^{de}±0.09
RAMPUR-32	3.51^{abc}±0.06	2.531^{bcde}±0.06
RAMPUR-36	2.88^{abcd}±1.42	3.172^{bcd}±1.42
RAMPUR-34	1.66^{cd}±0.28	1.491^{e}±0.28
RAMPUR-33	2.61^{abcd}±0.03	2.553^{bcde}±0.03
RAMPUR-21	2.28^{bcd}±0.16	2.047^{cde}±0.16
F.LOCAL	2.70^{abcd}±0.71	3.107^{bcd}±0.71
RAMPUR COMP	2.54^{bcd}±0.79	3.351^{abc}±0.79
TLBRS07F16	2.29^{abcd}±0.68	3.194^{bcd}±0.68
RAMS03F08	3.91^{ab}±0.51	3.219^{abc}±0.51
RML-32/RML-17	4.44^{a}±1.06	4.674^{a}±1.06
BGBYPOP	3.52^{abc}±0.39	3.402^{abc}±0.39
LSD	1.59*	1.3226*
CV (%)	27.66	21.9
Grand Mean	2.755	2.755

DAS: Days after sowing CV: Coefficient of variation, LSD: Least significant of difference, Means followed by the same letter in a column are not significantly different by DMRT at 5% level of significance, Sd (±) represents standard deviation.

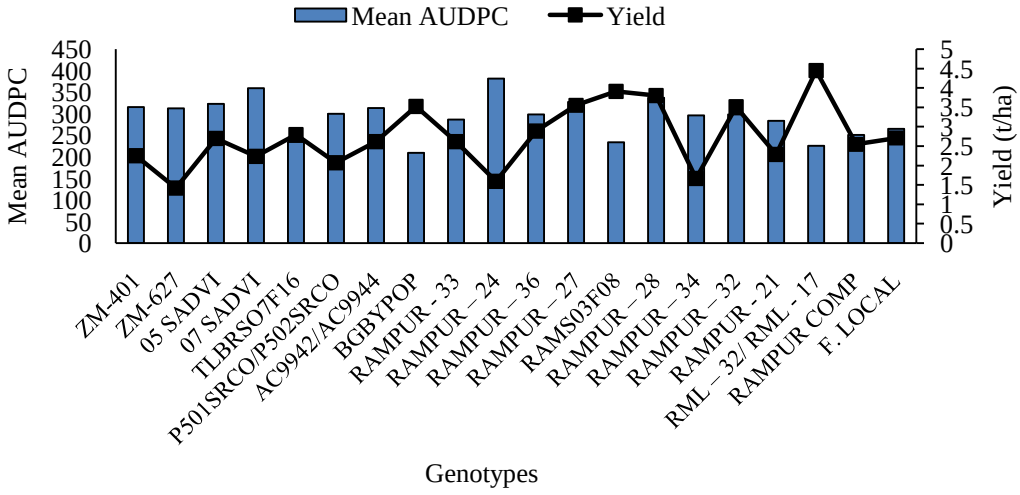

FIGURE 3 RELATION BETWEEN MEAN AUDPC AND YIELD OF GENOTYPES

Based on mean AUDPC, the genotypes were categorized as moderately resistant, moderately susceptible and susceptible against the pathogen.RAMPUR-24 and 07-SADVI was susceptible while BGBYPOP, RML-32/RML-17, RAMS03F08 and TLBRS07F16 were moderately resistant. Among the rest of the genotypes, many of them were moderately susceptible and susceptible.

3.3 Yield

Maximum grain yield (4.44 t/ha) was recorded in RML-32/RML-17 which was supported by Magar (2012).The yield of RML32/RML17 was at par with RAMS03FO8,RAMPUR-28 and BGBYPOP. The lowest grain yield was obtained in ZM-627 which was at par with the genotypes RAMPUR-24 and RAMPUR-34.

TABLE 5
DISEASE INCIDENCE ON MAIZE GENOTYPES IN SHADE HOUSE CONDITION AT RAMPUR, CHITWAN, OCTOBER, 2015

Genotypes	DI 14DAS	DI 15DAS
RAMPUR-24	41.66^{ab}±2.88	88.33^{a}±20.20
07 SADVI	49.33^{a}±5.13	93.33^{a}±11.54
RAMPUR-28	26.00^{efg}±1.73	42.33^{ef}±2.51
RAMPUR-27	30.00^{defg}±10	100.0^{a}±0.00
05 SADVI	20.66^{gh}±1.15	41.0^{ef}±7.93
ZM-401	37.00^{bcd}±2.64	91.66^{a}±14.43
AC9942/AC9944	31.66^{cde}±10.40	100^{a}±0.00
ZM-627	41.66^{ab}±10.40	100^{a}±0.00
P501SRCO/P502SRCO	38.33^{bcd}±10.40	100^{a}±0.00
RAMPUR-32	40.00^{bc}±5.00	86.66^{a}±23.09
RAMPUR-36	30.00^{defg}±0.00	63.33^{bc}±2.88
RAMPUR-34	37.33^{bcd}±4.04	68.33^{b}±2.88
RAMPUR-33	22.00^{fgh}±3.46	41.66^{ef}±6.50
RAMPUR-21	33.66^{bcde}±3.21	61.00^{bcd}±13.89
F.LOCAL	26.00^{efg}±1.73	54.66^{bcde}±0.57
RAMPUR COMP	30.66^{def}±1.15	45.00^{def}±0.00
TLBRS07F16	26.00^{efg}±1.73	57.66^{bcde}±2.51
RAMS03F08	25.33^{efg}±0.57	41.66^{ef}±5.77
RML-32/RML-17	20.66^{gh}±1.15	48.33^{cdef}±2.88
BGBYPOP	16.00^{h}±1.73	32.33^{f}±2.51
LSD	8.11***	15.38***
CV (%)	15.74	13.71
Grand Mean	31.2	67.866

DAS: Days after Sowing, CV: Coefficient of variation, LSD: Least significant of difference, Means followed by the same letter in a column are not significantly different by DMRT at 5% level of significance, Sd (±) represents standard deviation.

TABLE 6
CORRELATION BETWEEN FINAL DISEASE INCIDENCE, FINAL DISEASE SEVERITY, MEAN AUDPC AND YIELD (T/HA) AT RAMPUR, CHITWAN

Correlations				
	Final disease incidence	Final disease Severity	Mean AUDPC	Yield (ton/ha)
Final disease Incidence	1	.263	.462**	-.291
Final disease Severity		1	.664**	-.380*
Mean AUDPC			1	-.309
Yield (ton/ha)				1
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed				

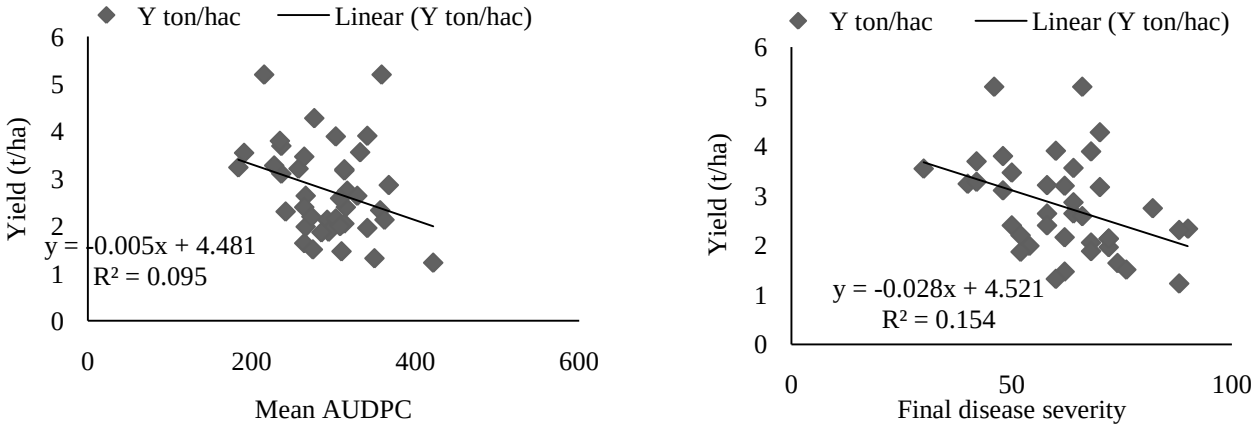

FIGURE 4. ESTIMATED LINEAR RELATIONSHIP BETWEEN YIELD AND MEAN AUDPC AND YIELD AND FINAL DISEASE SEVERITY OF 20 MAIZE GENOTYPES AT RAMPUR, CHITWAN

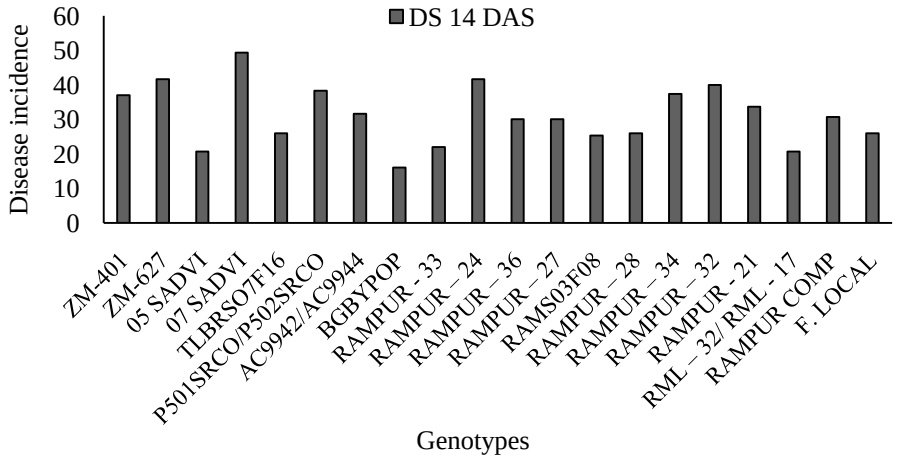

FIGURE 5 DISEASE INCIDENCE OF DIFFERENT GENOTYPES UNDER GREEN HOUSE CONDITION ON 14 DAS

IV. CONCLUSION

Among 20 maize genotypes, BGBYPOP, RML-32/RML-17 and RAMS03F08 were resistant to southern leaf blight of maize with lower disease severity and higher yield. These genotypes could be used as resistant varieties and can be used as sources of resistance for breeding. The genotypes like Rampur-24, 07 SADVI were highly susceptible to southern leaf blight of maize with maximum disease severity and mean AUDPC value. These genotypes can be used as susceptible check.Rampur-28, Rampur-27 and Rampur-32 had higher disease incidence and severity but grain yield was statistically similar with high yielders and the resistance genotypes BGBYPOP, RAMS03F08.Hence they can be used as tolerant genotypes against SLB.

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