

Varietal Screening of Cotton germplasms /cultures under natural conditions against *Alternaria alternata* causing Leaf Spot of Cotton

Parul Trivedi Mishra

Department of Botany , D.G.P.G College, Kanpur (India)

Email :dr.parulmishra610@gmail.com

ABSTRACT

Cotton (Gossypiumhirsutum L.) is one of the most important commercial crop playing a key role in economic and social affairs of the world. Alternariaalternata is amongst the main pathogen which causes great loss to the crop. So the experiments were conducted to find out the possibility of combating leaf spot of cotton through comprehensive varietal screening of cotton. It was done by using different resistant varieties. Varieties like -F-1054, Khandwa -2, PRT-80 and PRT-45 were found resistant (R), whereas CA-2, H-471 etc were found to be tolerant being disease free, (F) .

Key Words :-Gossypium, Alternaria alternata, varietal screening, tolerant

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INTRODUCTION

Cotton occupies a premier place in natural economy of our country due to its high grade fibre rich in vitamins enzymes and oil used as medicines. For such an important crop, some threats are also there in the form of pathogen *Alternariaalternata* which causes leaf spot of cotton – a major disease, affecting the crop both qualitatively and quantitatively. So in order to control the disease, the use of resistant varieties is the best method to eradicate the same in the present scenario [1-5]. In view of this aim , the present study was carried out to detect the source resistance against leaf spot of cotton caused by *Alternaria alternata* (Fries.), Keissler.

MATERIAL AND METHODS

Germplasm/cultures of cotton obtained from oil seed Research centre, Kalyanpur Kanpur and Cotton Research farm Chandra Shekhar Azad university of Agriculture and Technology , Kanpur were screened under natural conditions during Kharif season of the year 2014 in order to examine their reaction to the Pathogen . For this Germplasm/cultures of cotton variety “Vikas” were sown in randomized block design with three replications in a paired row plots of 2.5 meters in length. The fertilizers dose of N₈₀ – P₆₀ – K₄₀ per hectare was applied. The plots were irrigated from time to time maintain sufficient moisture. To test the germplasm for disease resistance, one infected row after every fifth line of the test germplasm was kept in order to build up good inoculums potential. The disease intensity was recorded on the basis of percentage leaf area affected at the time of harvest of the crop by randomly selecting 50 leaves from each replication [6]. The varieties and cultures were graded into six categories as in Table A given below:

Sl. No.	Grade	Reaction	Rating	Detailis of Infection
1.	0	Nil	---	No Infection
2.	1	Resistant	+	Upto 50% leaf area affected
3.	2	Moderately resistant	++	5-10% leaf area affected
4.	3	Moderately susceptible	+++	11-20% leaf area affected
5.	4	Susceptible	++++	21-30% leaf area affected
6.	5	Highly Susceptible	+++++	Above 30% leaf area affected

RESULT AND DISCUSSION

We could see the reaction and percentage disease intensity of cotton (*Gossypiumhissutum*L) Germplasms/Cultures to *AlternariaAlternata* (Fries), Keissler under natural conditions during the year 2014 in the given Table B.

Sl. No.	Germplasm /Culture	Average disease intensity in percent	Grade	Pathogenic Reaction	Pathogenic Effect
1.	CA-2	---	---	---	F
2.	CA-8	48.60	5	+++++	HS
3.	CA-874	44.52	5	+++++	HS
4.	CA-8735	5.97	2	++	MR
5.	DH-124	13.80	3	+++	MS
6.	F-1054	4.82	1	+	R
7.	G-8	22.37	4	++++	S
8.	H-471	---	---	---	F
9.	H-777	---	---	---	F
10.	H-999	46.20	4	++++	HS
11.	HS-(CF-33)	17.50	4	++++	MS
12.	HS-(CP-33)	47.35	5	+++++	HS
13.	IC-30811	7.83	2	++	MR
14.	KH-4	21.50	4	++++	S
15.	KHANDWA-2	1.71	1	+	R
16.	KS-72	---	---	---	F
17.	KS-72-5	20.34	4	++++	S
18.	LD-230	5.95	2	++	MR
19.	LD-380	7.75	2	++	MR
20.	LD-3262	22.35	4	++++	S
21.	LH-751	29.07	4	++++	S
22.	LH-900	20.68	4	++++	S
23.	LH-1050	58.75	5	+++++	HS
24.	LRK-5166	6.95	2	++	MR
25.	NT-113	18.19	3	+++	MS
26.	PRT-10	8.15	2	++	MR
27.	PRT-20	7.20	2	++	MR
28.	PRT-80	2.75	1	+	R
29.	PRT-45	1.95	1	+	R
30.	PRT-46	26.40	4	++++	S
31.	PRT-44	52.38	5	+++++	HS
32.	PRT-55	23.81	4	++++	S
33.	Pusa-39	25.11	4	++++	S
34.	RS-752	14.35	3	+++	MS
35.	Vikas	62.38	5	+++++	HS

- (F) = Denotes Free.
 (+) = Denotes Resistant
 (++) = Denotes Moderately Resistant
 (+++) = Denotes Moderately Susceptible
 (++++) = Denotes Susceptible
 (+++++) = Denotes Highly Susceptible

It is obvious from table B that 4 germplasm/cultures viz; CA-2, H-471, H-777 and KS-72 were found to be tolerant being Diseases Free (F). The 4-germplasm/cultures viz; F-1054, Khandwa-2, PRT-80 and PRT-45 were found Resistant (R). The disease intensity varied from

1.71 to 4.82 percent. The maximum disease intensity 4.82 percent was found in F-1054, followed by 2.75 percent in PRT-80, 1.94 percent in PRT-45 and 1.71 percent in Khandawa-2.

The 7 germplasm/cultures viz; CA-8735, IC-30811, LD-230, LD-380, LRK-5166, PRT-10 and PRT-20 were found Moderately Resistant (MR). The disease intensity varied from 5.95 percent to 7.75 percent. The maximum disease intensity 8.15 percent was found in PRT-10; followed by 7.83 percent in IC-30811; 7.75 percent in LD-380, 7.20 percent in PRT-20; 6.95 percent in LRK-5166; 5.97 percent in CA-8735; 5.95 percent in LD-230.

The 4 germplasm/culture viz, DH-124, HS (C-F-33); NT-113 and RS-752 were found moderately susceptible (MS). The disease intensity varied from 13.80 percent to 18.19 percent. The maximum disease intensity 18.19 percent was found NT-113; followed by 17.50 percent in HS(C-F-33); 14.35 percent in RS-752, 13.80 percent in DH-124.

The 9 germplasm/culture viz. LD-3262, G-8; KH-4; KS-72-5, LH-751; LH-900, PRT-46; PRT-55 and Pusa-39 were found susceptible (S). The disease intensity varied from 20.37 percent to 29.07 percent. The maximum disease intensity 29.07 percent was found LH-751; followed by 26.40 percent in PRT-46; 25.11 percent in Pusa-39; 23.81 percent in PRT-55, 22.37 percent in DH-124 G-8, 22.35 percent in LD-3262; 21.50 percent in KH-4; 20.68 percent in LH-900 and 20.34 percent in KS-72-5.

The 7 germplasm/culture viz. CA-8, CA-874; H-999; HS-(CP-33); LH-1050; PRT-44 and Vikas were found Highly Susceptible (HS). The disease intensity varied from 44.59 percent to 62.38 percent. The maximum disease intensity 62.38 percent was found in Vikas, followed by 58.79 percent in LH-1050; 52.30 percent in LH-1050; 52.30 percent in PRT-44; 48.60 percent in CA-8; 46.20 percent in H-999; 47.35 percent in HS(CP-33); and 44.52 percent in CA-874.

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