



Screening of Indian bean (*Lablab purpureus* L.) varieties/ germplasms against anthracnose (*Colletotrichum gloeosporioides* Penz. and Sacc.) under field conditions.

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ABSTRACT

Investigation on anthracnose (*Colletotrichum gloeosporioides* Penz. and Sacc.) of Indian bean (*Lablab purpureus* L.) under south Gujarat conditions was carried out in the Department of Plant Pathology, N. M. College of Agriculture, Navsari Agricultural University, Navsari during the year 2008-2009 to find out suitable management strategies. A field experiment was conducted in Rabi 2008 to screen five varieties and thirty nine germplasms of Indian bean against anthracnose. Out of these, three varieties Kapasi, JNP-4, Katargam and two germplasms NWP8 and NWP21 showed resistant reaction against anthracnose while fifteen germplasms viz., NWP12, 19, 20, 22, 24, 25, 26, 27, 28, 29, 30, 32, 35, 37, 39 were found to be moderately resistant, whereas variety NPS1 was found highly susceptible to anthracnose of Indian bean under south Gujarat conditions.

Key words: Anthracnose, germplasms, screening, varieties.

INTRODUCTION

Indian bean (*Lablab purpureus* L.) is an important pulse crop of Gujarat. There are two cultivated types of Indian bean viz., typicus and lignosus (Shivashankar *et al.*, 1971). Typicus is a garden type and is cultivated for its soft and edible pods. Lignosus is known as field bean and mainly cultivated for dry seed as pulse and is more popularly recognized as 'Wal', 'Wal-papdi' or 'Valor' in Gujarat state. The green pods are used for vegetable purpose whereas; ripe and dried seeds are consumed as split pulse. The seeds can sometimes be soaked in water overnight and when germination initiates, they can be sun-dried and stored for future use. The fodder has good palatability and the cattles are nourished well. It can also be used as nitrogen fixing pulse crop. The fresh/immature pods contain 4.5 per cent proteins and 10 percent carbohydrates (Kay, 1973). Occurrence of anthracnose in popular variety NPS1 of walpapdi or Indian bean was observed seriously in south Gujarat in *rabi* 2007 and isolated and identified as *C. gloeosporioides*. Out of various management strategies used, use of resistant varieties is an ideal, the simplest and the cheapest method for avoiding plant disease rather than control. Moreover, it does not disturb field eco-system and avoids hazards of environmental pollution by avoiding fungicides spray to overcome disease. The identification of the source of resistance is a basic need in breeding for disease resistance and hence the present investigation was carried out and the results are reported here.

MATERIALS AND METHODS

About five varieties (obtained from different parents) and thirty nine genotypes (obtained from same parents) of Indian bean obtained from same parents were grown at Pulse Research Station, NAU Navsari in *rabi* 2008 by road row side statistical method as seeds are available in very less quantity and observations on per cent disease index were recorded by selecting 5 plants in each treatment. The disease intensity was recorded by observing three trifoliate leaves, first of base, second of middle and third of upper portion of selected plant by using 0-6 standard scale. Observations were recorded at the initiation of the disease and at 15 days interval in field condition starting from germination to harvesting and were graded as mentioned below (Palarpawar and Ghurde, 1989) viz., 0- Nil, 1-0.1-10% , 2-10.1-20% , 3-20.1-30% , 4-30.1-40% , 5-40.1-50% , 6- >50.1%. The data was given here at about 45 days after sowing.

Formula for calculating per cent disease index is

$$PDI = \frac{\Sigma \text{ of ratings of plants infected}}{\text{No. of leaves observed} \times \text{Maximum disease score}} \times 100$$

Reaction of the disease was calculated on the basis of grades as follows (Datar and Mayee, 1981)

PDI (%) - Reaction viz., 0.0-10%- Resistant (R), 10.1-20%- Moderately Resistant (MR), 20.1-40% Moderately Susceptible (MS), 40.1-60% - Susceptible (S), above 60- Highly susceptible (HS).

RESULTS AND DISCUSSION

Out of five varieties and thirty nine germplasms screened under field conditions, minimum per cent disease index was recorded in variety Kapasi, therefore, JNP4 and Katargam while in case of germplasms NWP8 and NWP21 were regarded as resistant while fifteen germplasms *viz.*, NWP12, 19, 20, 22, 24, 25, 26, 27, 28, 29, 30, 32, 35, 37, 39 were found moderately resistant, variety NPS1 showed highly susceptible reaction (65.56 %) and germplasms NWP6 and NWP13 showed susceptible reaction and other varieties/ germplasms were moderately susceptible (Table 1). The varietal screening done here was the first report of resistant and moderately resistant varieties. This is very useful information. It is suggested to discourage the susceptible variety and to grow resistant to moderately resistant variety in this area after rigorous testing to maximize the production.

Three varieties Kapasi, JNP-4, Katargam and two germplasms NWP8 and NWP1 showed resistant reaction against anthracnose while fifteen germplasms *viz.*, NWP12, 19, 20, 22, 24, 25, 26, 27, 28, 29, 30, 32, 35, 37, 39 were found to be moderately resistant. Thus it is suggested to discourage the susceptible variety and to grow resistant to moderately resistant variety in south Gujarat area after rigorous testing to maximize the production and also in varietal improvement.

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Table 1. Reaction of different Indian bean varieties to *C. gloeosporioides* infection under field condition

Sr. No	Variety/germplasm	Percent Disease Index (PDI)	Disease reaction	Sr. No	Variety/germplasm	Percent Disease Index (PDI)	Disease reaction
1.	NPS1	65.56	HS	23	NWP20	13.33	MR
2.	Manchhi	22.22	MS	24	NWP21	10.00	R
3.	JNP 4	5.56	R	25	NWP22	18.89	MR
4.	Kapasi	2.22	R	26	NWP23	25.56	MS
5.	Katargam	7.78	R	27	NWP24	14.44	MR
6.	NWP1	33.33	MS	28	NWP25	16.67	MR
7.	NWP3	33.33	MS	29	NWP26	18.89	MR
8.	NWP4	25.56	MS	30	NWP27	18.89	MR
9	NWP5	30.00	MS	31	NWP28	18.89	MR
10	NWP6	43.33	S	32	NWP29	17.78	MR
11	NWP7	27.78	MS	33	NWP30	17.78	MR
12	NWP8	5.56	R	34	NWP32	11.11	MR
13	NWP10	23.33	MS	35	NWP33	23.33	MS
14	NWP11	21.11	MS	36	NWP34	31.11	MS
15	NWP12	12.22	MR	37	NWP35	17.78	MR
16	NWP13	50.00	S	38	NWP36	25.56	MS
17	NWP14	33.33	MS	39	NWP37	14.44	MR
18	NWP15	36.67	MS	40	NWP38	33.33	MS
19	NWP16	27.78	MS	41	NWP39	16.67	MR
20	NWP17	26.67	MS	42	NWP40	27.78	MS
21	NWP18	22.22	MS	43	NWP41	26.67	MS
22	NWP19	14.44	MR	44	NWP42	26.67	MS

Navsari Wal Papdi (NWP), Navsari Wal Papdi Selection (NPS), Resistant(R), Moderately Resistant (MR), Moderately Susceptible (MS), Susceptible(S), Highly susceptible(HS).

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