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Devan SR
M. Sc. Scholar, Dept. of Vegetable Science, Kittur Rani Channamma College of Horticulture, Arabhavi, Karnataka, India

Dr. Vijayakumar Rathod
Assistant Professor, Dept. of Vegetable Science, Kittur Rani Channamma College of Horticulture, Arabhavi, Karnataka, India

Dr. CN Hanchinamani
Professor and Head, Dept. of Vegetable Science, College of Horticulture, Bangalore, Karnataka, India

Dr. Kantharaju V
Professor of Plant Pathology and Head, ICAR- AICRP on Fruits, Kittur Rani Channamma College of Horticulture, Arabhavi, Karnataka, India

Sandhyrani Nishani
Assistant Professor and Head, Dept. Biotechnology and Crop improvement, Kittur Rani Channamma College of Horticulture, Arabhavi, Karnataka, India

Lakshmidevamma TN
Assistant Professor, Dept. of Biotechnology and Crop Improvement, College of Horticulture, Bangalore, Karnataka, India

Corresponding Author:
Devan SR
M. Sc. Scholar, Dept. of Vegetable Science, Kittur Rani Channamma College of Horticulture, Arabhavi, Karnataka, India

Evaluation of yard long bean (*Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdc.) Genotypes for web blight incidence under natural condition in northern dry zone (zone-3) of Karnataka

Devan SR, Dr. Vijayakumar Rathod, Dr. CN Hanchinamani, Dr. Kantharaju V, Sandhyrani Nishani and Lakshmidevamma TN

Abstract
The yard long bean although is a subspecies of cowpea used both in the form of raw as well as cooked. It is now getting more popular in non-traditional areas like Bangalore, Chennai, Mumbai, Haryana and New Delhi as an alternative to French bean. There is a demand for higher production of yard long bean but, due to biotic and abiotic factors there is decrease in production. Among biotic factors, web blight is severe damage to the yard long bean. Since, there is no such resistant variety released in yard long bean because of low level of variability in population, so present investigation to evaluate forty yard long bean genotypes against web blight incidence under natural condition was carried out. The forty yard long bean genotypes were placed in randomized complete block design with two replications. The analysis of variance revealed a highly significant difference among genotypes for web blight incidence. The results revealed that the genotype TCR86 had least (5.20) per cent incidence of web blight while EC693340 had highest (43.40) per cent incidence of web blight. The effect of incidence of web blight on pod yield per plot revealed that the lowest yield documented on TCR84 however highest on EC693338 and Arka Mangala. Based on disease scale, genotypes were categorized into three groups *viz*., highly resistant, moderately resistant and resistant. Further evaluation of these genotypes with least per cent incidence of web blight coupled with higher yield is amenable for plant breeder to develop high yielding resistance genotypes.

Keywords: Yard long bean, web blight, variability, EC693338, arka mangala and disease scale

Introduction
Yard long bean (*Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdc. 2n=22) belongs to the Leguminosae family with a pantropical genus and is cultivated mainly for its crisp and tender green pods. It is a highly nutritive legume vegetable which is also known as “poor man's meat” as it is an abundant and inexpensive source of digestible protein content of 23.5-26.3% (Ano and Ubochi, 2008) [1]. The crop, native of Central West Africa is now extensively cultivated in many South East Asian countries such as Taiwan, Philippines, Indonesia, Thailand and India (Rambabu *et al.*, 2016) [2]. It is now getting more popular in non-traditional areas like Bangalore, Cochin, Chennai, Mumbai, Haryana and New Delhi as an alternative to French bean and is cultivated both in open and protected conditions. Although it has a high yield potential the actual yield of this crop is low which is due to biotic factors such as web blight. A biotic component such as web blight caused by *Rhizoctonia solani* causes severe yield loss in India (Shahima *et al*., 2018) [3]. At initially collar rot is noticed with in thirty days of sowing. Later it advances to appear as small round lesions on leaf which enlarge to irregular water soaked regions. The control of this disease as become big menace due to several reasons such as epidemiology and evolution of new strains against available fungicides and many more. The most beneficial and effective method to control web blight disease in yard long bean appeared to be host plant resistance. Breeding of variety showing high yield and resistance against web blight is an excellent technique to overcome economic loss to farmer. Since, there is no such resistant variety released in yard long bean because of low level of variability in population, the present manuscript reports the evaluation of forty yard long bean genotypes against web blight incidence under natural condition with the main objective to identify best genotypes showing lesser incidence of web blight with higher yield.

Materials and methods

The experiment was carried out under natural field condition at Department of Vegetable Science, Kittur Rani Channamma College of Horticulture, Arabhavi, University of Horticultural Sciences, Bagalkote during *Kharif*, 2019-20. Among forty yard long bean genotypes (Table 1), twenty were collected from ICAR-NBPGR, Regional station- Thrissur, one genotype from ICAR-IIHR, Bangalore, Nine genotypes from ICRISAT, Hyderabad and other genotypes from Kerala State Agriculture University and private sector hybrid. The experiment laid on 6m^2 plot in Randomized complete block design with two replications. The cultural practices were carried out as per the package of practice of University of Horticultural Sciences, Bagalkote. The per cent disease incidence of web blight was recorded from randomly chosen five plants from each genotype. The per cent of disease incidence was calculated based on the part of the plant affected, size of the lesion, yellowing and drying of infected leaves by using 0-9 disease scale (Stonehouse, 1994) [4]. The incidence of web blight recorded via scale (0%- no symptoms; 1- 1 to 10% of leaf area infected; 3- 11 to 25% of leaf area infected; 5- 26 to 50% leaf area infected; 7- 51 to 75% leaf area infected; 9- more than 75% leaf area infected) was given by (Mayee and Dattar, 1986) [5].

Per cent disease incidence (PDI) determined with the above scales by using the below formulae.

$$PDI(\%) = \frac{\text{Sum of grade of each leaves}}{\text{Number of leaves assessed} \times \text{Maximum grade used}} \text{x } 100$$

The obtained data were subjected to the Fisher's analysis of variance. The critical difference (CD) values were obtained at one per cent level of significance.

Results and Discussion

In zone- 3, the per cent incidence range of web blight varied from 5.20 - 43.40 per cent. High incidence was observed due to high humidity and high temperature during September to November 2019 and the incidence was low during December due to low temperature (Table 1). Similar results were also reported by Lambe and Dunleavy (1967) [6] in soyabean; Thies *et al*., (1997) [7] in cowpea. Table 2 shows significant difference at 1 per cent for web blight incidence among forty yard long bean genotypes. The highest per cent incidence of web blight disease (Table 2) was observed in genotypes EC69340 (43.40%) followed by Pant Vegetable (37.70%), EC693344 (37.40%), EC693337 (36.90%), EC693336 (35.50%) , EC693341 (31.60%), EC693334 (31.20%) and VS-50 (30.10%) while, lowest incidence of web blight disease was noticed in TCR86 (5.20%) followed by TCR87 (7.80%), TCR104 (9.60%), TCR117 (11.20%), TCR124 (11.80%), Lola (13.00%) Arka Mangala (13.40%). It indicates a wider range of per cent incidence of web blight between 40 genotypes. Similar results were also documented by Litty (2015) [8] in yard long bean; Sivakumar (2012) [9] in vegetable cowpea.

The effect of incidence of web blight on pod yield per plot revealed that the lowest yield was documented in TCR84 followed by TCR115, TCR125, TCR112, TCR119, TCR79 and TCR117 while, highest yield was observed in genotypes EC693338 followed by Arka Mangala, Khunthi Local, Bobli and Serpan 601 (Table 2). This indicates, while we are going to apply selection pressure on yield and yield attributing characters, we are inattentive to the lower incidence web blight genotypes against the high yielding genotypes with higher incidence of disease. These findings are consistent with result of Guptha and Singh (2002) [10] in mung bean; Manjesh *et al*. (2018) [11] in yard long bean. A continuous selection and cleistogamy nature of crop becomes susceptible to newer strain of web blight. Since the genotypes showing least incidence may be useful in further resistant breeding programme for development of high yielding varieties with resistance genes.

Based on disease scale, genotypes were categorized into three groups such as highly resistant (TCR87,TCR86 and 104) , moderately resistant (EC693345, EC693344, Trivandrum Local, VS-50, EC693333, EC693334, EC693341 EC693336, EC693340, EC693337, Pant Vegtable-20 and EC693338) and rest of all the genotypes under resistant group (Table 2). These results are in line with the findings of Sivakumar *et*. (2018) [12]. The experiment has shown higher pod yield associated with lower incidence of web blight. Finally the genotypes showed high yield associated with least incidence and resistant reaction against web blight and these were utilized for further evaluation in different agro climatic condition to know performance and stability of genotypes on yield and web blight incidence.

Table 1: Meteorological data recorded during the period of experimentation (2019-20) at Agricultural Research Station, Arabhavi – 591 218

Month	Temperature (ºC)		Relative humidity (%)	Rainfall (cm)
	Maximum	Minimum		
September-2019	32.80	20.40	91.60	47.50
October-2019	34.00	18.60	90.10	22.60
November-2019	32.40	15.00	86.70	3.20
December-2019	32.70	12.70	79.30	0.00

Table 2: Evaluation of yard long bean genotype for per cent disease incidence of web blight under natural conditions

S. No.	Genotype	Per cent disease incidence	Effect on yield per plot	Scale	Reaction
1	TCR122	14.10	2.89	3	Resistant
2	TCR87	7.80	4.55	1	Highly resistant
3	TCR86	5.20	4.11	1	Highly resistant
4	TCR119	16.30	3.12	3	Resistant
5	TCR117	11.20	3.99	3	Resistant
6	Pant Vegetable-20	19.80	5.33	3	Resistant
7	EC693345	26.30	5.89	5	Moderately resistant
8	TCR125	22.30	2.69	3	Resistant
9	TCR84	16.20	2.41	3	Resistant
10	TCR79	18.20	3.90	3	Resistant

11	TCR124	11.80	5.24	3	Resistant
12	TCR115	13.80	2.58	3	Resistant
13	Araka Mangala	13.40	9.29	3	Resistant
14	TCR104	9.60	3.86	1	Highly resistant
15	EC693344	37.40	6.86	5	Moderately resistant
16	TCR80	20.60	4.52	3	Resistant
17	TCR85	24.20	5.47	3	Resistant
18	TCR88	23.50	5.25	3	Resistant
19	TCR116	14.70	4.44	3	Resistant
20	TCR89	21.90	5.95	3	Resistant
21	Trivandrum Local	25.40	7.39	5	Moderately resistant
22	Khunthi Local	21.90	9.06	3	Resistant
23	Bhubaneswar Local	19.60	6.95	3	Resistant
24	Githika	15.50	7.34	3	Resistant
25	Lola	13.00	5.54	3	Resistant
26	Bobli	17.20	7.62	3	Resistant
27	Vyjayanthi	20.20	6.63	3	Resistant
28	Vellayani Jyothika	25.00	7.17	3	Resistant
29	VS-50	30.10	5.66	5	Moderately resistant
30	EC693333	26.50	3.42	5	Moderately resistant
31	EC693334	31.20	4.20	5	Moderately resistant
32	EC693341	31.60	3.89	5	Moderately resistant
33	EC693336	35.50	6.23	5	Moderately resistant
34	EC693348	18.30	5.40	3	Resistant
35	EC693340	43.40	5.98	5	Moderately resistant
36	EC693337	36.90	4.31	5	Moderately resistant
37	Pant Vegtable-20	37.70	4.03	5	Moderately resistant
38	EC693338	26.10	10.43	5	Moderately resistant
39	Avka	20.50	6.45	3	Resistant
40	Serpan 601	22.20	7.36	3	Resistant
	S.Em±	1.87	0.25		
	CD@5%	7.18	0.99		

Conclusion

There is increase in demand for yard long bean throughout the country. There is a need for high yielding varieties, which are resistance to both biotic and abiotic stress and suitable for different agro climatic condition. Experimental results revealed that per cent incidence of web blight ranged from 5.20- 43.40 per cent in Northern dry zone of Karnataka. The genotypes EC693338, Arka Mangala, Khunthi Local, Bhubaneswar Local, Bobli, Vyjayanthi and Vellayani Jyothika recorded moderate incidence of web blight coupled with high pod yield per plot. Further evaluatiion of least per cent incidence of web blight genotypes coupled with higher yield is amenable for plant breeder to develop high yielding resistance genotypes.

References

1. Ano AO, Ubochi CI. Nutrient composition of climbing and prostrate vegetable cowpea accessions. African J. Biotech 2008;7(20):3795-3798.
2. Rambabu E, Ravinderreddy K, Kamala V, Saidaiah P, Pandravada SR. Genetic variability and heritability for quality, yield and yield components in yard long bean (*Vigna unguiculata* ssp. *sesquipedalis* (L.) Verdc.). Green Farming 2016;7(2):311-315.
3. Shahina K, Luthra YP, Gandhi SK. Role of zinc and manganese in resistance of cowpea root rot. J. plant Dis. Prot 2003;110:235-243.
4. Stonehouse J. Assesment of Andean bean disease using visual keys. Plant pathology 1994;43:519-527.
5. Mayee CD, Dattar VV. Phytopathometry, Technical Bulletin-1, Marathwada Agricultural University, Akola. 1986, 146.
6. Lambe RC, Dunleavy JM. Soybean root and stem rot caused by Rhizoctonia solani. Plant Dis. Rep 1967;56:870.
7. Thies JA, Jaimini SN, Asawa BM, Mathur JR. Genetic variability, interrelationship characters for seed yield in cowpea (*Vigna unguiculata* (L)Walp.). Leg. Res 1997;23:92-96.
8. Litty V. Identification of yard long bean (*Vigna unguiculata* subsp. *sesquipedalis* (L.) Verdcourt) genotypes suitable for polyhouse cultivation. M.Sc. (Hort) Thesis, Kerala Agricultural University, Thrissur 2015, 140.
9. Sivakumar V. Screening of vegetable cowpea (*Vigna unguiculata* (L) Walp) germplasm for yield quality and resistance to collar rot and web blight. M.Sc. (Hort.) Thesis, Kerala Agricultural University, Thrissur 2012, 175.
10. Gupta RP, Singh RV. Assessment of yield losses in mung bean due to Rhizoctonia solani. Journal of Mycology and Plant Pathology 2002;32:142.
11. Manjesh M, Adivappar N, Jayalakshmi K, Girijesh GK. Effect of plant spacing on yield and rust disease incidence of yard long bean (*Vigna unguiculata* ssp. *sesquipedalis*) in Southren transitional zone of Karnataka. J. Pharmacogn. Phytochem 2018;7(2):1246-1248.
12. Sivakumar V, Celine VA, Girija VK. Evaluation of yard long bean (*Vigna unguiculata* subsp. *sesquipedalis*) genotypes for collar rot and web blight. Int. J. Curr. Microbiol. App. Sci 2018;7(7):4238-4245.