



ISSN: 0975-833X

RESEARCH ARTICLE

DISTRIBUTION OF POWDERY MILDEW OF GREENGRAM IN MAJOR GROWING AREAS OF NORTHERN KARNATAKA, INDIA

*Praveenkumar Yadahalli, Kulkarni, S. A., Noorulla, H., Gururaj Sunkad, Mallesh, S. B. and Konda, C. R.

Department of Plant Pathology, University of Agricultural Sciences, Raichur-584 104, Karnataka, India

ARTICLE INFO

Article History:

Received 10th May, 2013
Received in revised form
28th June, 2013
Accepted 16th July, 2013
Published online 30th August, 2013

Key words:

Survey, Greengram,
Erysiphe polygoni,
and Powdery mildew.

ABSTRACT

Greengram powdery mildew caused by *Erysiphe polygoni* is a major disease in greengram growing areas of northern Karnataka and causes considerable yield loss in greengram and other pulse crops. Survey was conducted during *kharif*, 2012 revealed that the greengram powdery mildew was prevalent in all greengram growing fields in parts of northern Karnataka. However, incidence was maximum at Bidar followed by Gulbarga and Yadgir districts and least was at Raichur.

Copyright © Praveenkumar Yadahalli, et al., This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Greengram (*Vigna radiata* L.), is one of the most important food legumes grown in India and third most important pulse crop of India after chickpea and pigeonpea. It is a rich in easily digestible protein (24 %) and adds much needed diversity to the cereal-based diets of the poor (Thirumaran and Seralathan, 1988). Mungbean contains vitamin A (94 mg), iron (7.3 mg), calcium (124 mg), zinc (3 mg) and folate (549 mg) per 100 g dry seed (Calloway *et al.*, 1994). In India greengram is cultivated over an area of 28.19 lakh hectares with a production of 10.34 lakh tones and productivity of 420 kg/ha (Anon, 2012). Among different states, in Karnataka it occupies an area of 3.98 lakh ha with a production of 0.85 lakh tones and productivity of 206 kg/ha (Anon, 2012). The crop suffers heavily due to fungal and viral diseases. Among them, powdery mildew caused by *Erysiphe polygoni* is one of the economically important disease. The disease powdery mildew is particularly severe in late sown *kharif* crop and under favorable condition, could be severe even on early *kharif* crop. The symptoms of disease are usually observed on 35-40 days old crop (Khare *et al.*, 1998), *i.e.*, during flowering and pod formation stage (Arjunan *et al.*, 1976). Yield reduction is characterized by the reduction in photosynthetic activity and physiological changes as considerable, which leads to potential decrease in yield (20-40 per cent) depending on the stage and time at which the disease appears (Legapsi *et al.*, 1978). Yield losses ranging from 9 to 50 per cent have been reported from Taiwan in farmers field (Anon, 1982). Grain yield losses have been reported up to 21% (Quebral and Cowel, 1978). Survey of the powdery mildew disease over a period of time gives the intensity with which it affects the yield and quality. Presently disease is very severe in parts of northern Karnataka, but there is no

systematic survey of the disease. Hence, in this study, effort has been made to document the disease occurrence in major growing areas of Karnataka, India.

MATERIAL AND METHODS

A roving (Random) survey for incidence of powdery mildew of greengram was taken up during August-September 2012 in different major growing areas like Raichur, Gulbarga, Yadgir and Bidar. In each district 4 talukas, in each talukas 4 villages and in each village 4 farmers field were selected and observations regarding disease severity were recorded. The greengram fields on the survey route were visited and the observation on powdery mildew severity, were recorded by following of 0-9 scale (0 - No symptoms, 1-Small white specks on the leaf covering 1% or less of the area, 3-Small powdery patches covering 1-10% of the leaf area, 5- Powdery lesions enlarged covering 11-25% of the leaf area, 7 - Powdery patches irregular in size covering 26-50 % of leaf area and 9 - White powdery growth covering more than 50% leaf area (Mayee and Datar, 1986). The recorded grade values were converted into per cent disease index (PDI) by using following formula proposed by Wheeler (1969).

Sum of the individual disease ratings

Per cent disease index (PDI) = ----- × 100

No. of leaves observed × Maximum disease grade

RESULTS AND DISCUSSIONS

Greengram is one of the important pulse crop of northern Karnataka grown under rainfed conditions. The most commonly grown cultivars include Chinmung, Sel4 and BGS9. Though crop is grown in vast climatic conditions, it is known to be hampered by a large number of diseases. Of the disease challenging its production,

*Corresponding author: Praveenkumar Yadahalli,
Department of Plant Pathology, University of Agricultural Sciences, Raichur-
584 104, Karnataka, India.

Table 1. Incidence of powdery mildew of greengram in different districts of northern Karnataka during *kharif*, 2012

District	Taluks	Villages	No. of fields	Stage of the crop (DAS)	PDI	Mean PDI in taluks	Mean PDI in districts	
Raichur	Devadurga	Vandali	4	40	30.54	30.68	29.63	
		Sunkeshwarhal	4	45	33.88			
		Jalahalli	4	43	27.21			
	Raichur	Arquera	4	45	31.10	28.57		
		Ashapur	4	50	31.66			
		Chandrabanda	4	42	33.88			
		Heerapur	4	43	28.78			
		Yaragera	4	45	19.99			
	Manvi	Arisingi	4	43	35.54	29.43		
		Kallur	4	42	28.88			
		Harvi	4	41	36.09			
	Lingasugur	Neer manvi	4	45	17.22	29.84		
		Gurgunta	4	45	36.09			
		Madkihal	4	45	29.43			
		Mudagal	4	42	25.54			
		Santekallur	4	43	28.32			
	Gulbarga	Gulbarga	Firozabad	4	46	40.40		39.54
			Mahagaon	4	45	37.05		
Pattan			4	43	38.54			
Sannu			4	42	42.18			
Chincholli		Kodli	4	43	41.65	37.33		
		Nidagunda	4	42	37.15			
		Ratakhal	4	45	34.99			
		Sulepeth	4	43	35.53			
		Kodla	4	42	42.21			
Sedam		Namar	4	41	39.99	40.45		
		Gounalli	4	45	39.04			
		Handaraki	4	43	40.57			
		Hirur	4	43	36.09			
Chittapur		Tengali	4	45	31.10	35.25		
		Vatavatti	4	46	33.88			
		Sugareddy	4	43	39.94			
		Kandagul	4	45	53.32			
		Khanapur	4	43	43.74			
Bidar	Aurad	Kouta (B)	4	40	40.77	44.60		
		Santapur	4	40	40.58			
		Byalhalli	4	50	37.21			
		Chalkapur	4	45	41.65			
	Halbarga	Halbarga	4	45	42.21	41.93		
		Mehekar	4	45	46.66			
		Janwad	4	48	49.43			
		Chikpeth	4	45	41.47			
	Markhal	Markhal	4	40	43.18	44.57		
		Noubad	4	40	43.72			
		Dhummansur	4	40	47.20			
		Dubalgundi	4	45	40.57			
Humnabad	Nimbur	4	45	40.40	43.01			
	Alur	4	43	43.88				
	Doranahalli	4	42	59.99				
	Savoor	4	43	37.77				
Yadgir	Yadgir	Gundalli	4	43	27.48	39.01		
		Sagar	4	42	30.82			
		B.gudi	4	44	30.30			
		Adanur	4	45	41.88			
	Shahapur	Madriki	4	43	37.10	36.48		
		Hattigudur	4	45	36.66			
		Devapur	4	46	38.77			
		Rukmapur	4	43	38.21			
	Shorapur	Besthal	4	42	37.99	36.27		
		Shantapur	4	42	30.13			

Erysiphe polygoni inciting Powderymildew disease is most notorious leading to yield losses. In the foregoing study, a cursory effort has been made to document the extent of disease in the major growing areas of Karnataka and so to correlate the same with yield loss. From the survey data it is self explanatory that, disease incidence varied across location as well as cultivar used. However, incidence was maximum at Bidar district (43.52%) followed by Gulbarga district (38.14%) and least incidence was noticed at Yadgir district (37.25%). Among the places surveyed in Bidar maximum disease incidence was noticed at Kandagul (53.32%) and was followed by Janwad with 49.43 per cent and the least incidence was observed at Byalhalli (37.21 %). In a similar way there was variation with respect to

disease incidence even in Gulbarga, Raichur as well as Yadgir district. The variation of disease incidence in various localities is mainly attributed to the climatic factors like temperature, relative humidity and distribution and amount of rain fall followed by cultural practices like sanitation and other suitable management practices. The age of the crop and the cool nights and dry weather situation is more favourable for the powdery mildew disease to attain severity (Aust and Jurgren, 1986). In this study, the results obtained are in line with findings of Anand Singh and Anil Sirohi (2003) who recorded maximum powderymildew disease incidence in case of black gram in the regions where there is less rain, cooler nights and high day temperatures exists. The other possible reason for the maximum

incidence of disease at Bidar could be monocropping practice coupled with cultural practice which favours disease incidence. The common practice in this region is immediately after harvest, the infected stubbles are left as such in the field and these stubbles act as primary source of inoculums in succeeding crop. In nutshell, incidence of powderymildew disease varied across location, crop age and cultivar used.

Acknowledgment

Authors would like to acknowledge Faculty members of College of Agriculture Raichur, Karnataka.

REFERENCES

- Anand Singh and Anil Sirohi. 2003. Effect of some weather parameters on the development of powdery mildew (*Erysiphe polygoni* DC) in Black gram. *Plant Disease Research*, 18(1):63-64.
- Anonymous. 1982. Asian Vegetable Research and Development Centre, Centerpoint shanhua, Taiwan, *Republic of China*, 3(1): 85.
- Anonymous. 2012. *Area, Production and Productivity of mungbean in India*. Ministry of Agriculture Government of India. pp. 35.
- Arjunan, G., Vidyasekaran, P. and Kolandaisamy, S. 1976. How to control diseases of green gram. *Farmer and Parliament*, 12:17-18.
- Aust, H. J. and Jurgren, H. H. 1986. Microclimate in relation to epidemics of powdery mildew. *Annual Review of Phytopathology*, 29: 144-145.
- Calloway, D. H., Murphy, S. P. and Bunch, S. 1994. *User's guide to the international minilist nutrient database*. Department of Nutritional Sciences. University of California, Berkeley, pp. 175.
- Chaube, H. S. and Singh, R. S. 2001. Introductory Plant Pathology. International Book Distributing Co., Lucknow, pp. 132.
- Khare. N., Lankpale, N. and Agarwal, K. C. 1998. Epidemiology of powdery mildew of mungbean in Chattisgarh region of Madhya Pradesh. *Journal of Mycology and Plant Pathology*, 28: 5-10.
- Legapsi, B. M., Catipon, E. M. and Hubbl, J. N. 1978. AVRDC Phillippine Qutreach programme Mungbean studies. *First International Symposium on Mungbean*, pp.32.
- Mayee, C. D. and Datar, V. V. 1986. *Phytopathometry Technical Bulletin-1* (special bulletin-3). Marathwada Agricultural University, Parbhani. p. 146.
- Quebral, F. C. and Cowell, R. 1978. Powdery mildew and cercospora leaf spot of greengram in Philippines. *First International greengram symposium*, Philippines. pp. 147-148.
- Sudheendra Ashtaputre, Srikant Kulkarni, Shivaprasad, M., Rao, M. S. L., Kulkarni, V. R. and Mohankumar, H. D. 2007. Survey and surveillance for the incidence of powdery mildew of chilli in Northern Karnataka. *Annals of Biology*, 23: 177-183.
- Thirumaran, A. S. and Seralathan, M. A. 1988. Utilization of mungbean. In: Proceedings of the Second International Symposium on Mungbean. AVRDC, Shanhua, Taiwan. AVRDC Publication No. 470-485.
- Wheeler, B. E. J. 1969. *An Introduction to Plant Disease*. John Wiley and Sons Ltd., London, pp. 301.
