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Survey of Sclerotinia stem rot of mustard in Eastern Uttar Pradesh

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Abstract

Mustard (*Brassica juncea* L.) is one of the major oilseed crops in Rajasthan India. In mustard group of crop are the most important oil seed crop during *Rabi* session. The mustard are grown chiefly for their oil. Survey of the severity of stem rot of mustard was conducted in each two village of two tehsil in selected seven district of eastern U.P. *Viz.*, Varanasi, Azamgarh, Sultanpur, Mirzapur, Jaunpur, Mau and Bhadohi during *Rabi* Season 2019-20 and 2021-22. The maximum percent of disease incidence was recorded in Mau (27.99%) Followed by Bhadohi (26.44%) and minimum PDI was recorded in Jaunpur (15.41%) in year 2019-20. In the year 2021-22 the maximum average PDI was recorded in Varanasi (24.74%) followed by Sultanpur (23.41%) and minimum average PDI was recorded in Mau (20.16%).

Keywords: Survey, mustard and incidence

Introduction

Mustard (*Brassica juncea* L.) is one of the major oilseed crops in Rajasthan India. In mustard group of crop are the most important oilseed crop during *Rabi* session. The mustard are grown chiefly for their oil. The oil is utilized for human consumption throughout the country and particularly in North India, where it is difficult to the replace by any other oil. The mustard crop grown in subtropical and tropical countries both. India is the third position with regard to average and production of mustard in the world. In India, mustard are cultivated on an area of 6856.27 hectare with a production of 9123.64 million tons and with an productivity 1331 kg/hectare in 2020. (Anonymous 2020) [3].

More than twenty disease affect the crop with great economic bearings. The destructive disease of mustard including those caused by fungi, bacteria, viruses and phytoplasma. Among the disease, stem rot caused by fungus *Sclerotinia sclerotiorum* (Lib.) de Bary is next only to Alternaria blight in importance. Stem rot of mustard is wide spread and worldwide in distribution and has been reported in other countries like Canada (Morall, 1976) [2], Germany (Kirchner and Pluschkell, 1979) [4] and Nepal (Chaudhary, 1993) [5]. In India, Shaw and Ajrekar (1915) [6] reported this disease first time from Pusa, Bihar on mustard crop. Recently, stem rot of mustard emerged in serious form in many parts of the country *Viz.*, Haryana, Himachal Pradesh, Punjab, Bihar and Uttar Pradesh (Kumar and Thakur, 2000) [7].

The pathogen attacked all the part of the mustard plant and produced different type of symptom in severe condition. The sclerotia of the fungus may be formed on the outside of the stem where they are quite apparent and causing stem rot. The disease appear as elongated water-shoked area on the stem. Later on this water-shoked areas are covered with a cottony mycelial growth of the fungus. The lesions gradually increase in size and in favorable conditions girdle the stem completely resulting in wilting and death of the plant. The affected area become white and tends to shred and numerous grayish-white to black sclerotia of various forms and sizes appear on the surface of the lesion and also inside the pith (Chahal, 1982) [8].

Material and Methods

During the crop season of Ravi 2019-20 and 2020-21, a survey for the severity of Stem rot of Mustard was conducted in each two village of two tahsil in selected seven districts of Eastern Uttar Pradesh i.e., Varanasi, Azamgarh, Sultanpur, Mirzapur, Jaunpur, Mau and Bhadohi. Collection of disease samples Naturally infected stem of mustard were recorded at different locations. Samples of diseased stem of mustard sowing characteristics symptom of stem rot were collected from seven districts *Viz.* Varanasi, Azamgarh, Sultanpur, Mirzapur, Jaunpur, Mau and Bhadohi during *Ravi* season 2019-20 and 2020- 21. Disease incidence (%) of downy

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mildew of each village was estimated with the formula given below-

$$\text{Disease incidence} = \frac{\text{Number of infected plants}}{\text{Total number of plants}} \times 100$$

Disease severity (%) was determined according to the scale of (Biswas *et al.*, 1992)^[1].

Results and Discussion

In order to know the disease incidence of stem rot of mustard, a survey was conducted for collection of natural disease samples during the *Rabi* season 2019-20 and 2020-21 from different districts of Eastern Uttar Pradesh. During the survey, it was found that most farmers grew local variety of Mustard. The less infection of stem rot may be due to crop rotation followed by the farmers or resistance was present in local variety.

The result presented in Table-1 the maximum percent of disease incidence (PDI) was recorded in Mau (27.99) followed by Bhadohi (26.44), Sultanpur (25.58), Varanasi (24.16), Azamgarh (22.49), Mirzapur (21.41) and minimum PDI was recorded in Jaunpur (15.41) in year 2019-20. The maximum (29.00) percent disease incidence was recorded in Chainpur in Lambhuatahsil, Sultanpur and minimum (12.00) percent disease incidence were recorded in Sidhai, in Shahganj tahsil, Jaunpur in 2019-20.

In year 2020-21 result presented in Table-1 the maximum average PDI (%) was recorded in Varanasi (24.74) followed by Sultanpur (23.41), Mirzapur (22.66), Azamgarh (21.49), Badhohi (20.99), Jaunpur (20.91) and minimum average PDI (%) was recorded in Mau (20.16). The maximum PDI (27.00) was recorded in Basani village of Pindra tahsil of Varanasi district and minimum PDI (15.00) was recorded in Ramrai Patti village in Jaunpur Sadar tahsil of Jaunpur in 2020-21.

Table 1: Disease incidences of stem rot of mustard during *Rabi* season of 2019-20 and 2020-21

District	Tehsil	Village	In Year 2019-20				In Year 2020-21					
			65 DAS	85 DAS	105 DAS	% Disease incidence	Average Percent Disease incidence	65 DAS	85 DAS	105 DAS	% Disease incidence	Average Percent Disease incidence
Varanasi	Gangapur	Ramraipur	28	28	14	23.33	24.16	18	24	30	24.00	24.74
		Saghat	22	18	36	24.33		16	28	32	25.33	
	Pindra	Ashapur	24	19	34	25.66		20	19	30	22.66	
		Basani	18	22	30	23.33		22	29	30	27.00	
Azamgarh	Lalganj	Upenda	14	20	18	17.33	22.49	12	18	20	16.66	21.49
		Pakadi	22	29	32	27.66		17	21	29	22.33	
	Nizamabad	Nadauli	30	13	26	23.00		21	28	32	27.00	
		Kotwalipur	24	17	25	22.00		17	20	23	20.00	
Sultanpur	Lambhua	Gyanpur	08	12	20	13.33	25.58	29	31	24	28.00	23.41
		Chainpur	18	32	37	29.00		22	18	27	22.33	
	Kadipur	Badhna	22	28	30	26.66		24	21	28	24.33	
		Kalan	30	34	36	33.33		16	18	23	19.00	
Mirzapur	Chunar	Amdahan	12	16	24	17.33	21.41	26	24	30	22.66	22.66
		Phulwari	19	24	26	23.00		27	21	32	26.66	
	Lalganj	Dewari	20	26	28	24.66		08	16	22	15.33	
		Chaurai	16	22	24	20.66		26	22	30	26.00	
Jaunpur	Sadar	Kazi Ahmad Noor	13	14	20	15.66	15.41	16	24	34	24.66	20.91
		Ramrai Patti	08	12	18	12.66		09	15	21	15.00	
	Shahganj	Sidhai	07	11	18	12.00		21	27	30	26.00	
		Takha Purab	12	18	26	21.33		14	19	21	18.00	
Mau	Madhuban	Chakwara	17	23	30	23.33	27.99	14	19	27	20.00	20.16
		Kutubpur	13	15	20	16.00		17	21	23	20.33	
	Ghosi	Ahirauli	22	24	28	24.66		13	19	23	18.33	
		Amila	16	21	23	20.20		16	22	28	22.00	
Bhadohi	Aurai	Banuli	15	17	22	18.00	26.44	17	19	27	21.00	20.99
		Domanapur	17	20	25	20.66		14	20	22	18.66	
	Gyanpur	Udhopur	19	23	27	23.00		18	19	26	21.00	
		Sowari	11	19	23	17.66		21	23	26	23.33	

Conclusion

The stem rot of mustard is assuming serious mustard disease. In several mustard growing areas in different district of Eastern Uttar Pradesh. It was found that the incidence of the disease varied from in different district in eastern U.P. In the year 2019-20 the maximum disease incidence was (27.99) at Mau and minimum (15.41) at Jaunpur district in eastern Uttar Pradesh.

In the year 2020-21 the maximum disease incidence was recorded in Varanasi (24.74) and minimum disease incidence was (20.16) Mau district.

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