



EFFECT OF AIRBORNE FLY ASH DEPOSITION ON PATHOLOGICAL PARAMETERS OF BRASSICA NIGRA AND GLYCINE MAX WITH REFERENCE TO BLACK SPOT DISEASE.

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ABSTRACT In the current study, the effects of fly ash deposition on important oilseed crops i.e., Black mustard and Glycine max were evaluated for pathological parameters in villages located around the Parichha Thermal Power Plant, Jhansi. the crop situated near and far away from thermal power plant shows a significant difference in their pathological characters. There is no effect of distance on prevalence of disease. The disease found in all area but the crops of villages located near and far away from Thermal Power Plant shows high disease incidence and severity percentage than that located at moderate distance.

INDEX TERMS Growth, Development, Black mustard, Fly ash, pathological observation.

INTRODUCTION Fly ash is by product of thermal power plant after the combustion of pulverised coal. Indian coal has high ash content (35-45%) as found by Mathur et al. (2003). The disposal of fly ash poses a significant challenge due to the fact that it is itself a waste product Kanchan et al. (2015). In general, it is known to be rich in variety of trace elements e.g., B, Ca, Mo Se etc. in spite of this it may be toxic in high concentration (Mehra et al., 2000). High pH, excessive carbon, negligible nitrogen and phosphorus, toxic concentrations of heavy metals, and radioactive elements may cause stunted growth, altered biochemical compositions, and decreased productivity in plants growing on fly ash and fly ash amended soils Bhattacharya et al., (2006). According to a number of studies on the use of fly ash in agricultural practices, depending on the dosage, it may or may not have an impact on plant growth and biochemical makeup (Adriano et al., 1980; Khan and Khan, 1996; Tripathy and Sahu, 1997; Kalra et al., 2000; Singh and Siddiqui, 2003). In present study we choose Black mustard and Soybean crop for pathological study with reference to fly ash impact on it. This crop mainly influenced by fungal disease namely black spot disease. In oilseed rape, mustard, and other cruciferous crops, Alternaria black spot (*Alternaria brassicae*) is the primary serious disease having global spread efficiency can cause severe output losses (Prasad et al.2023; Kuamar et al. 2014). Fungi isolated from from fields effected by fly ash (S.Shrivastav et. al. 2018). Therefore, the purpose of the current investigation is to ascertain how fly ash affects the development of various isolated fungus from ash-contaminated soil.

RRESEARCH METHODOLOGY

Survey method used for identification of disease in Mustard and Soybean crop fields around the Parichha Thermal Power Plant. The villages are selected randomly around the power plant according to increasing distance (Range up to 12 km.) from it. Prevalence of disease were observed physically by identifying the disease on plants in selected villages. Severity percentage measured on the basis of visualising the infected area on plant and scoring it. Severity percentage calculated by counting diseased plants from randomly selected plants from the field and calculate the percentage of plants suffering from disease.

RESULTS

SURVEY FOR PREVALENCE OF DISEASE A survey was carried out at 20 villages around the Parichha thermal power plant, Jhansi, Uttar Pradesh during kharif and Rabi season of 2017 and 2018. The result shown in Table- 1 and state that the prevalence of disease was found in all selected 20 villages.

Sr. No.	Village	Crop season	
		Soybean	Mustard
1	Parichha	+	+
2	Barata	+	+
3	Ujayan	+	+
4	Behta palar	+	+
5	Lidhora	+	+
6	Gulara	+	+
7	Hajipura	+	+
8	Barei	+	+
9	Marora	+	+
10	Jori khurd	+	+
11	sarol	+	+
12	Maheba	+	+
13	Badagaon	+	+
14	chakra	+	+
15	Pahari	+	+
16	Chirgaon	+	+
17	Jaryayi	+	+
18	Miyapur	+	+
19	Chirona	+	+
20	sultanpura	+	+

+ :
Presence
of disease.

INCIDENCE AND SEVERITY OF LEAF SPOT DISEASE IN SOYABEAN

Incidence and severity of leaf spot disease of soybean are shown in Table- 2. incidence percentage found higher in villages near to paricha thermal power plant to after that it get down and again increased and after that it gets its normal growth (Fig.1). The incidence and severity were found lowest in village Jori khurd that is 43.33 % and 18.0 % respectively. This village lies at middle of selected distance as we cross this distance, again the Incidence and Severity percentage get increased. Number of infected plants becomes low in middle area.

Table 2: Incidence and severity of leaf spot disease of soybean in around Parichha Thermal Power Plant Jhansi.

Sr. no.	Village	No. of plant study	No. of infected plant	Incidence %	Severity %
1	Parichha	30	20	66.66	23.0
2	Barata	30	20	65.23	23.5
3	Ujayan	30	21	70.00	23.0
4	Behta palar	30	19	63.33	23.4
5	Lidhora	30	18	60.00	23.0
6	Gulara	30	17	56.66	22.0
7	Hajipura	30	17	56.66	22.1
8	Barei	30	15	50.00	20.0
9	Marora	30	14	46.66	18.8
10	Jori khurd	30	13	43.33	18.0
11	sarol	30	14	46.66	18.9
12	Maheba	30	15	50.00	18.9
13	Badagaon	30	15	50.00	19.5
14	chakra	30	18	60.00	20.0
15	Pahari	30	20	66.42	20.5
16	Chirgaon	30	21	70.00	22.8
17	Jaryayi	30	19	63.33	21.6
18	Miyapur	30	19	64.52	22.4
19	Chirona	30	16	53.33	22.6
20	sultanpura	30	17	56.66	22.8

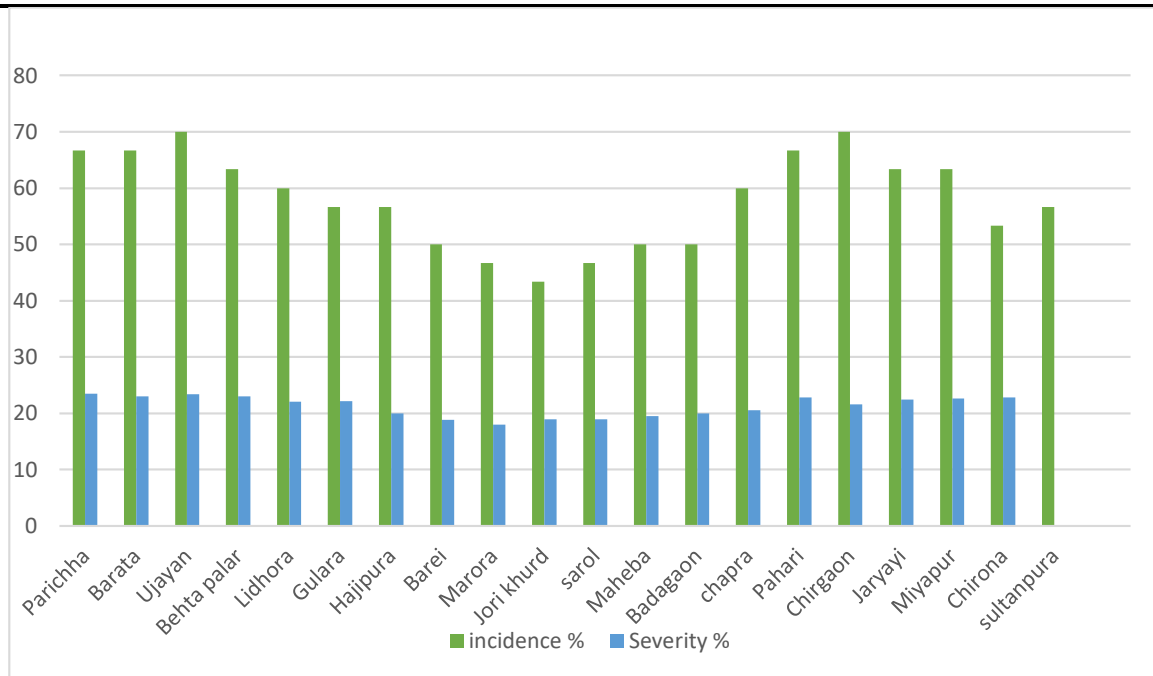


Fig 1. Incidence and severity of leaf spot disease of soybean

Incidence and severity of leaf spot disease in mustard

The incidence and severity of leaf spot disease of mustard (Table-2) shows up and down pattern. Villages that are situated at reasonable distance to Thermal Power Plant shows lower incidence and severity percentage of leaf spot disease. Gradual fall of incidence and severity start from village Lidhora to Sarol and after it again get swing to reach high point (Fig-2). The highest finding were observed in village behta palar for disease incidence percentage and in village Parichha Disease percentage was 25.6% and it is highest value compare to other villages.

Sr. no.	Village	No. of plant study	No. of infected plant	Incidence %	Severity %
1	Parichha	30	21	70.0	25.6
2	Barata	30	20	66.6	25.0
3	Ujayan	30	22	73.3	25.0
4	Behta palar	30	23	76.6	23.0
5	Lidhora	30	18	60.0	22.8
6	Gulara	30	18	60.0	22.1
7	Hajipura	30	17	56.6	19.9
8	Barei	30	16	53.3	19.5
9	Marora	30	15	50.0	18.5
10	Jori khurd	30	14	46.6	17.8
11	sarol	30	13	43.3	18.3

12	Maheba	30	16	53.3	18.7
13	Badagaon	30	15	50.0	19.0
14	chapra	30	19	63.3	22.1
15	Pahari	30	20	66.6	23.2
16	Chirgaon	30	21	70.0	24.8
17	Jaryayi	30	22	73.3	24.7
18	Miyapur	30	19	63.3	23.6
19	Chirona	30	16	53.3	23.4
20	sultanpura	30	18	60.0	24.0

Table 3: Incidence and severity of leaf spot disease of mustard around Parichha Thermal Power Plant Jhansi.

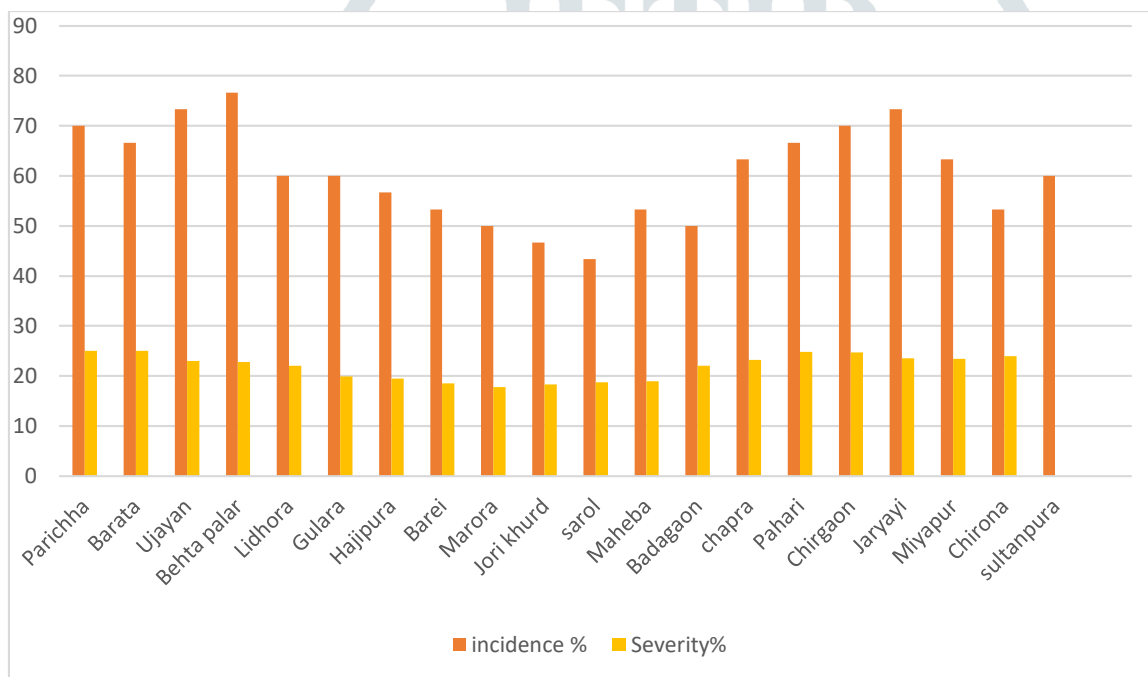


Fig 2: Disease incidence and severity percentage of mustard.

CONCLUSION

From above interpretation this can be concluded that distance plays an important role in pathological parameters of black spot disease. There is no effect of distance on Prevalence of disease but Crop and fungi both are affected by fly ash. High concentration of fly ash imposed adverse effect on crop and pathogenic fungi. Moderate quantity of fly ash support crop plants.

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