

EFFECT OF POWDERY MILDEW INFECTION ON GROWTH AND YIELD OF BLACKGRAM

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The effect of infection of powdery mildew pathogen on the growth characters namely, shoot length, root length, nodulation and of plants were studied. It was observed that as the intensity of the disease increased, there was considerable change in these growth characters.

In blackgram considerable losses in production occur as a result of powdery mildew disease caused by *Erysiphe polygoni* DC. The adverse effects of powdery mildew disease on growth and yield were studied and the results are reported in this communication.

MATERIAL AND METHODS

Powdery mildew pathogen *Erysiphe Polygoni* DC was maintained on blackgram plants by periodic inoculation of plants of 30 days of age. A water suspension of conidia was prepared and the spore concentration was adjusted to 10^6 spore/ml of water. It was sprayed on healthy leaves of 30 days old plants. After inoculation the plants were covered by polythene bags to maintain a high humidity for disease development. The seeds of Co4. Blackgram were sown at 10 days interval. Groups of plants at 30, 40, 50 days of age were artificially inoculated. The observations on the shoot length, root length and number of nodules were made on 60th day. Suitable control plants were maintained by

spraying the plants with Morestan (0.1%). To assess the loss due to the disease, sets of 50 plants of 40 days and 50 days of age were inoculated. The individual grain yields were recorded. A set of 50 plants was maintained as control and these plants were sprayed with Morestan 0.1%. The grain yield of 50 infected and 50 healthy plants in the field was also recorded.

RESULTS AND DISCUSSION

There was significant reduction in shoot length of the plants when young plants were infected (Table-1). The plants inoculated on the 30 and 40 days after sowing showed considerable reduction in shoot length and the adverse effect on this parameter due to infection was on par. There was no significant effect on shoot length if 50 days old plants were infected.

The plants inoculated on the 30th day showed maximum reduction in root length than rest of the treatments. It was on par with plants infected at 40 days of age. But there was no difference

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between the root length of control plants and the root length of plants inoculated on 50 days after sowing indicated that older plants when infected did not suffer significantly.

The maximum reduction in the number of nodules was observed in the plants infected at 30 days of age and the number of nodules was significantly less than in plants infected at 40 and 50 days of age. The adverse effect on the number of nodules formed in plants infected at 40 days of age was significantly less than the plants inoculated at 30 days of age but greater than the plants inoculated at 50 days of age which showed least adverse effect when compared to the other treatments.

The results presented in Table 2 showed that there was a reduction in the yield of the plants infected by powdery mildew pathogen, the percentage reduction in yield of plants inoculated on the 40th day was 20.

The growth of the plants can be expected to be adversely affected if infection occurs in the early growth phase of plants. The present study showed that plants infected at 30 days of age had poor root system when compared to plants infected at later stages. Paulch (1969) also reported that the root growth was often considerably reduced resulting in smaller root shoot ratio in the barley plants infected

with powdery mildew pathogen. Zakharova (1978) also reported that root growth of pea plants markedly was arrested due to the infection by *E. polygoni*. The results of the experiment to assess yield loss showed that there was reduction in the yield of crop when plants were infected at 50 days of age. This may be due to the infection of plants at critical stage of setting of the pods.

The present findings are in accordance with those of Hayes (1970) who reported that 39 percent loss in grain yield in oats was due to the infection at the ear head formation stage. Narasinghani (1978) reported that infection of pea with *E. polygoni* led to significant reduction in yield of pea which was attributed to significant reduction in seed number and pod number in the infected plants.

REFERENCES

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Table 1. Effect of powdery mildew infection on shoot length root length nodulation and yield of Black gram (mean of 12 plants)

Effect of infection	Control (un inoculated)	Age of plants inoculations.			C. D. (P=0.05)
		30 days	40 days	50 days	
Shoot length (cm)	32.2	30.0	29.3	31.8	1.2
Root length (cm)	19.8	17.6	18.1	19.2	0.7
Nodulation	44.1	38.6	41.1	43.9	1.8

Table 2. Effect of powdery mildew infection on yield of black gram.

	Control	Plants inoculated at		Field yield	
		40 days	50 days	Control	Infected
Mean yield	4.86	3.94	3.60	3.80	3.40
Mean disease intensity grade	—	2.00	2.30	—	2.36
r _s value	—	-0.94	-0.38	—	0.46*

*Significant at 5 percent level