Occurrence, cultivar reaction and yield losses due to leaf blight of wheat

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Key words: Leaf blight, wheat, Helminthosporium sativum, Alternaria triticina

Leaf blight of wheat is considered a serious disease of North-eastern region of the country. It has gained significance in North-western states also, particularly under rice wheat cropping system (5). Among the pathogens causing blights on wheat Helminthosporium sativum Pamm, King and Bakke and Alternaria triticina Prasada and Prabhu are considered important. Singh and Srivastava (4) reported that H. sativum is more important than A. triticina. Since, most of the commercial varieties are susceptible to leaf blight and sufficient information pertaining to epidemiology of the disease and the losses due to it in Haryana is not available, an effort was made to study some aspects of the disease.

Wheat crop was surveyed during 1995-96 and 1996-97 seasons and a total of 50 and 65 leaf blight samples were collected from North-eastern parts (Karnal, Kurukshetra, Faridabad, Ambala and Kaithal) and South western parts (Hisar, Bhiwani, Rewari and Rohtak) Haryana. Small leaf bits were incubated at 25±10C. for 48h in moist chamber and examined under microscope for association of leaf blight pathogens. The pathogens associated were purified and maintained for further studies.

Analysis of blighted samples revealed that H. sativum dominated in North-eastern Haryana having 70-76% frequency, whereas A. triticina was prominent in South-western districts with 80-85% distribution frequency. By and large, H. sativum proved to be dominating under rice - wheat cropping system. In the last two decades, rice-wheat rotation has rapidly expanded in Punjab, Haryana and western Uttar Pradesh, mainly due to development of wheat. The environmental conditions also remain congenial for the survival and development of pathogen throughout the year (5). It is possible that H. sativum might be perpetuating on rice stubbles to cause infection in wheat crop.

In a randomized block design experiment susceptible variety Agra local was sown in the field (5.0 m x 4.0 m) and artificially inoculated with H. sativum at boot leaf stage. The check plots were protected by spraying maneb @ 0.2% at weekly intervals starting from a day before inoculation of the pathogen. Twenty plants each of 0-9 grade (3) were selected from inoculation rows at random and tagged. Subsequently, ear heads of each were separately harvested, threshed and 1000-grain weight taken. Regression analysis was done to establish relationship between disease intensity and yield losses.

There was considerable loss in weight of the grains. Weight of 1000-grains in different grades decreased from 38.0g to 21.0g as compared to 38.6 from healthy plants. Loss in 1000-grain weight upto grade 3 was negligible i.e. only 1.5, 2.8 and 4.1 percent in 1, 2 and 3, respectively. It increased with increase in disease intensity, being 45.6% in grades 7, 8 and 9. In infection grade 4, 5 and 6, the yield losses were 19.4, 28.7 and 34.4 per cent, respectively. Regression analysis of 1000-grain weight in relation to disease intensity showed that unit increase in intensity resulted in 0.26 unit decrease in grain weight and holds good ($r^2 = 0.935$). Similarly, analysis of inter-relationship between disease intensity and yield loss revealed that unit increase in intensity and yield loss resulted in 0.67 units increase in yield loss and holds good ($r^2 = 0.936$). These results confirm the earlier observations of Neema and Joshi (2) that the reduction in grain weight due to H. sativum is directly correlated to disease intensity.

Performance of 16 commercially grown wheat cultivars against H. sativum was assessed under artificial conditions of infection created in a polyhouse tunnel (1). The disease was recorded at dough stage of the crop following 0-9 scale (3). Based on disease responses varieties were grouped into the following categories - Immune (0) or resistant (1-2) : None; Moderately resistant (4) : WH 157, WH 283; Moderately susceptible

References

REFERENCES


Received for publication March 16, 1998