Himachal Journal of Agricultural Research 40(1):91-95 (2014)

Short Note

Status and distribution of Alternaria blight associated with rapeseed-mustard in Himachal Pradesh

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Manuscript Received: 05.11.2013; Accepted: 11.02.2014

Abstract

Survey across different production fields of rapeseed-mustard in seven districts of Himachal Pradesh was carried out to determine the extent of disease incidence and severity of Alternaria blight caused by *Alternaria brassicae*. The disease incidence and severity remained low to moderate across different areas of Himachal Pradesh with disease incidence of 14 to 42 per cent and disease severity between 10 to 36 per cent. Maximum disease was recorded from Una district having the mean incidence and severity of 34.3 and 26.8 per cent followed by Kangra district with high incidence (42%) in Jamanabad and Samloti locations.

Key words: Alternaria blight, *Brassica*, incidence, severity.

Rapeseed-mustard is the most important group of crops among oilseeds in Himachal Pradesh which accounts for about 57 per cent of the total oilseeds area and contributes 60 per cent to the total oilseeds production. This group of crops is grown in an area of about 8890 ha with annual production of 4510 metric tonnes and productivity of 5.07 quintals per hectare (Anonymous, 2010). Among the biotic stresses, Alternaria blight disease caused by *Alternaria brassicae* (Berk.) Sacc. has been reported from all the continents of the world and is one among the important diseases of Indian mustard causing up to 47% yield losses (Kolte, 1985). The disease is also known to occur in all rapeseed-mustard growing regions of Himachal Pradesh but its severity is more in low and mid hills where it causes 10.7 to 27.5 per cent yield losses (Kumar, 1997). The severe reduction in the yield and quantitative difference in oil contents of rapeseed-mustard crops are caused by *A. brassicae* and its severity is negatively correlated to seed yield (Tripathi *et al*. 1987; Chattopadhyay and Bagchi, 1994). The loss in oil contents of seed from heavily infected rapeseed plants by *A. brassicae* ranges from 14.6 to 39.6 per cent depending upon cultivars (Ansari *et al*., 1988). With the view towards importance of crop, a survey of different rapeseed-mustard growing areas of Himachal Pradesh was undertaken during February/March 2010 to assess the distribution of Alternaria blight caused by *Alternaria brassicae*. Observations were recorded on disease severity, incidence, crop species and cultivars across from 32 locations of major rapeseed-mustard growing districts of Himachal Pradesh (Table 1). Disease incidence was calculated by counting the infected and healthy plants in the particular field and per cent incidence was calculated by the formula as

given below. The scoring of Alternaria blight at leaf stage was done as per method of Conn *et al*. (1990) on 0-6 scale and disease severity was calculated as per the formula given by Mckinney (1923):

$$\text{Disease incidence}(\%) = \frac{\text{Total number of plants infected}}{\text{Total number of plants assessed}} \text{X100}$$

$$\text{Disease Severity}(\%) = \frac{\text{Sum of all disease ratings}}{\text{Total no.of ratings x Maximum disease grade}} \text{X100}$$

Pooled data of disease survey revealed that the disease was prevalent on all the cultivars in almost all the potential rapeseed-mustard producing areas of Himachal Pradesh with disease incidence of 14 to 42 per cent and disease severity between 10 to 36 per cent (Fig. 1). Comparatively more disease incidence was recorded in Una, Kangra and Sirmour districts (Fig. 2). In Una district, the disease incidence varied between 32-36 per cent with an average of 34.3 per cent in various locations, maximum being in Basoli (36 %) and minimum in Bangana (32%) areas. The disease severity in Una district ranged from 24.0 to 28.0 per cent. Different locations in Kangra district showed 14 to 42 per cent disease incidence with an average of 31.8 per cent over various locations, maximum being in Jamanabad and Samloti (42%) and minimum in Paprola (14%) areas. Disease severity was maximum at Samloti (36%) and minimum at Palampur (10%). Sirmour district showed 26 to 38 per cent disease incidence and 21 to 30 per cent disease severity. The disease severity and disease incidence were maximum at Dhaulakuan area.

Four locations surveyed in Bilaspur district showed 24 to 36 per cent disease incidence and maximum incidence was recorded in Berthin area (36 %). Disease severity ranged from 19 - 28 per cent and it was maximum at Berthin. In Hamirpur district, the most disease affected areas were Bohini, Bada, Taroka and Nadoun. The average disease severity in Hamirpur was 23.5 per cent and average disease incidence was 30.1 per cent. Out of four locations surveyed in Chamba district, the maximum disease incidence (28%) and severity (21%) were observed in Banikhet area. In Mandi district, the disease incidence varied between 18.5 - 22.0 per cent with an average of 20.2 per cent in various locations and disease severity average for the district was 15.3 per cent. The occurrence of Alternaria blight has been reported from all the states of India with varying severity and incidence (Mehta *et al*., 2005). Moderate to high severity of Alternaria blight has been observed in Punjab, Haryana, Uttar Pradesh, Rajasthan and West Bengal during 2009-2010 (AICRP, 2010). Variation in the disease incidence and severity at different locations may be attributed to the prevailing weather condition at different locations. Khan *et al*. (2007) have also reported variation in the occurrence, incidence and severity of Alternaria blight in several locations of district Aligarh in Uttar Pradesh.

In present study, the disease incidence and severity remained low to moderate across different areas of Himachal Pradesh. This variation is attributed to varying climatic conditions in different areas and probably due to presence of different pathotypes infecting different *Brassica* spp.

Table 1. Status and distribution of Alternaria blight of rapeseed-mustard in Himachal Pradesh

Location	Crop species	Cultivar	Disease incidence (%)	Disease severity (%)
Bilaspur				
Berthin	*B. rapa*	Local	36.0	28.0
Ghumarwin	*B. juncea*	Local	29.0	25.0
Nihari	*B. rapa*	Local	33.0	25.0
Dadhol	*B. rapa*	Local	24.0	19.0
Chamba				
Kator	*B. rapa*	Local	26.0	20.0
Shiunta	*B. rapa*	Local	22.5	18.0
Bajoli	*B. juncea*	Local	24.0	16.0
Banikhet	*B. juncea*	Local	28.0	21.0
Hamirpur				
Nadaun	*B. juncea*	Local	26.5	20.0
Bohni	*B. rapa*	Local	38.0	28.0
Taroka	*B. carinata*	Jayanti	28.0	22.0
Bada	*B. rapa*	Local	32.0	24.0
Mandi				
Jaur	*B. rapa*	Local	18.5	12.0
Jalugram	*B. juncea*	Local	22.0	16.0
Mansana	*B. napus*	Neelam	20.0	18.0
Kangra				
Jamanabad	*B. juncea*	Local	42.0	34.0
Dharamshala	*B. juncea*	Local	24.0	20.0
Arla	*B. rapa*	Local	34.0	29.0
Kangra	*B. juncea*	Varuna	39.0	32.0
Darang	*B. rapa*	Local	33.0	25.0
Palampur	*B. juncea*	Local	16.0	10.0
Paprola	*B. rapa*	Local	14.0	12.5
Samloti	*B. juncea*	Local	42.0	36.0
Nagrota	*B. rapa*	Local	36.0	26.0
Nurpur	*B. juncea*	Local	38.0	26.0
Sirmour				
Dhaulakuan	*B. carinata*	Jayanti	38.0	30.0
Sarahan	*B. juncea*	Local	28.0	22.0
Nahan	*B. rapa*	Local	26.0	21.0
Una				
Amb	*B. juncea*	Local	35.0	28.0
Basoli	*B. napus*	GSL-1	36.0	28.0
Bangana	*B. carinata*	Jayanti	32.0	27.0
Haroli	*B. juncea*	Local	34.0	24.0

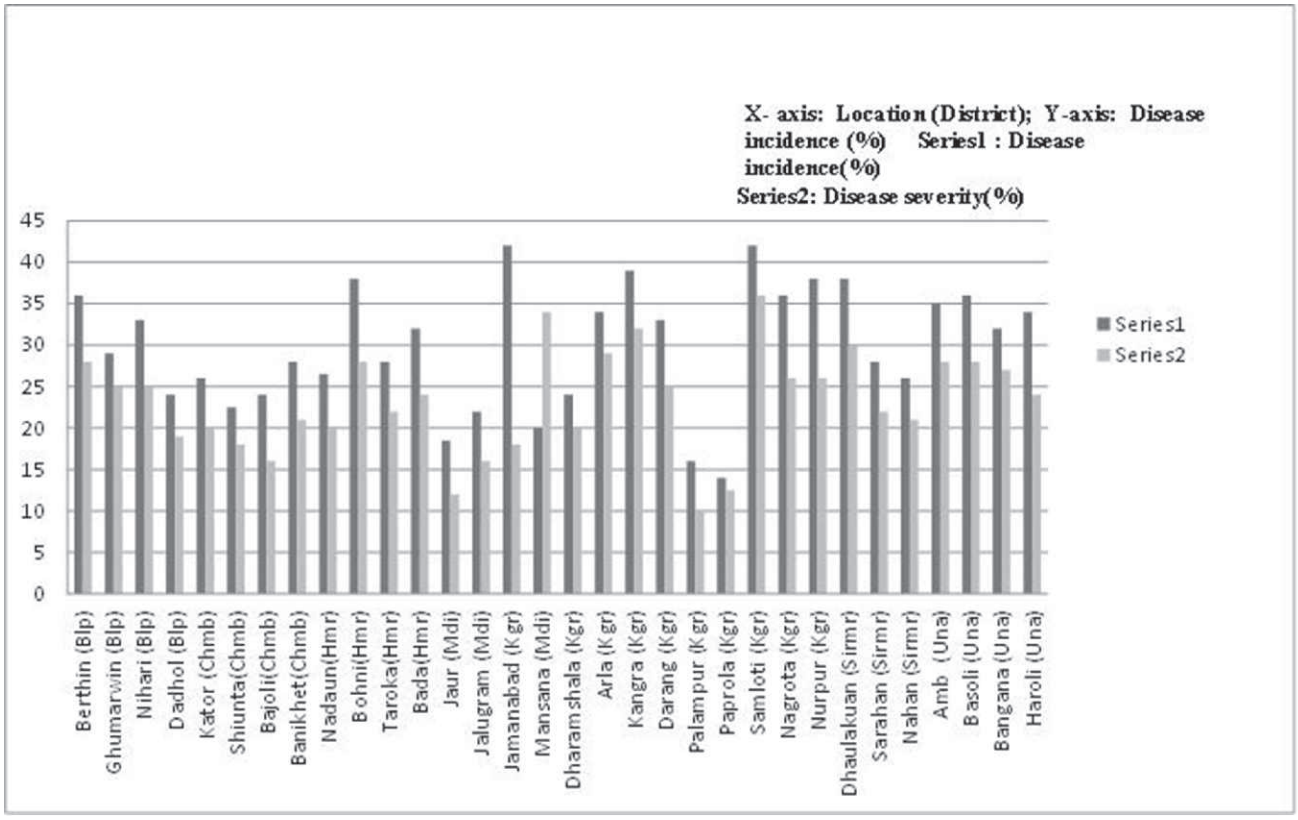

Fig 1. Status and distribution of Alternaria blight of rapeseed- mustard

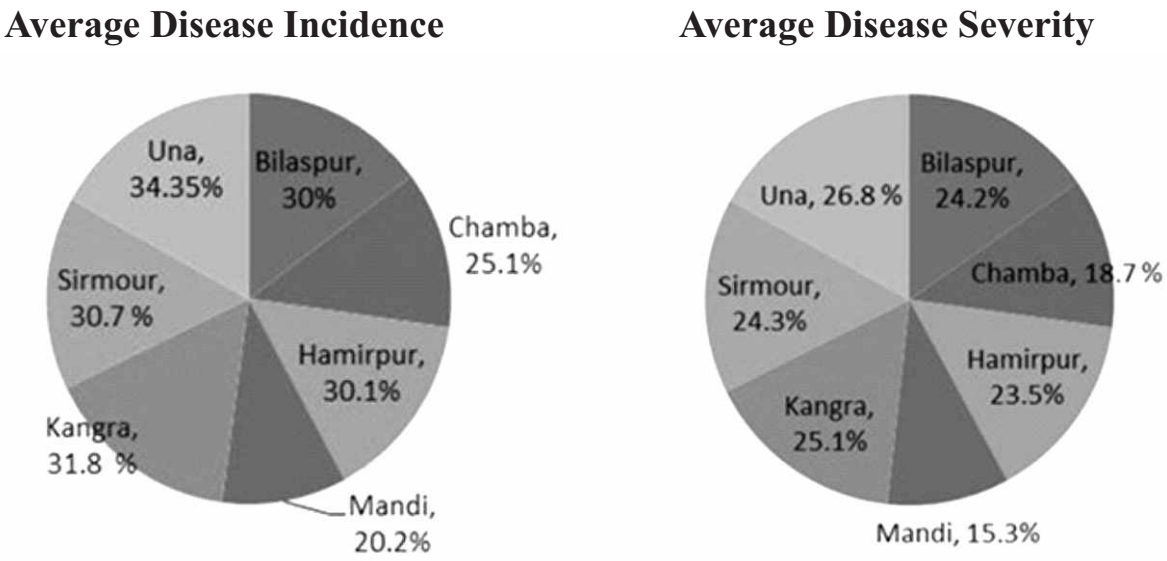

Fig 2. Distribution of Alternaria blight of rapeseed- mustard caused by *Alternaria brassicae* in Himachal Pradesh

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