

FOLIAR FUNGAL DISEASE SCENARIO IN DIFFERENT FARMING SYSTEMS OF MID HILLS

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The prevalence of shifting cultivation, raised bed along the slopes and unabated deforestation have led to serious degradation of soil, water, flora and faunal resources. On an average 40 t soil/ha/year is lost from the water-sheds on account of shifting cultivation which amounts to 181 t of annual soil loss (Anon, 1997). Studies are in progress to develop alternative farming system to replace *jhuming* at ICAR Complex, Umiam consisting of different land use systems. A survey was conducted on existing crops of the different farming systems during October 1997 to January 1998 to know the occurrence of various foliar fungal diseases and their intensity.

Disease samples were collected and repeated isolations were made at regular intervals and brought in pure culture on PDA (Potato dextrose agar). Pathogens were identified based on the descriptions given by Singh (1982). Some pathogens were identified based on the comparison made with the earlier reports. For calculating plant disease index (PDI), 50 leaves were randomly selected and ratings were done based on the visual ratings given by Narayana Bhat (1988) and Mayee and Datar (1986) for tree species and field crops respectively.

$$PDI = \frac{\text{Sum of all ratings}}{\text{number of leaves assessed} \times \text{maximum disease score}} \times 100$$

For each disease, PDI was calculated when the disease intensity was maximum. For dry rhizome rot of ginger, percent incidence wise calculated based on the number of rhizomes infected out of 100 rhizomes.

Various diseases occurring on different crops/tree species in eight farming systems is presented in Table 1. Maximum PDI was recorded in *A. nepalensis* with 88.88% in W_5 followed by 84.22% in groundnut (w_6). For rest of the crops/trees species, it ranged from 15.33% in *S. populnea* (w_3) to 83.21% in *A. nepalensis* (w_6). There was no foliar fungal disease on turmeric, oat, Assam lemon, orange, peach, pineapple, guava during the period of observations in different farming systems. Repeated isolation from *Alnus* yielded *C. gloeosporioides* and perusal of literature indicated that it is reported for the first time.

Similarly *Bipolaris* sp. and *Cylindrosporium* sp. on broom grass, *C. gloeosporioides* on *S. populnea* and *F hookerii* and *phoma* sp. on *M. oblonga* are reported for the first time. There is however, no report of this pathogen on *F hookerii* and hence a new record. Dadwal and Jamaluddin (1992) recorded *C gloeosporioides* on *F religiosa*. *Phoma* sp. on *Michelia champaca* is known to cause blackening of young sheets (Anon, 1995-96). In the present study *Phoma* sp. caused leaf spot on *M. oblonga* and *M champaca*. Rest of the pathogens were reported earlier (Singh, 1973, Mukerji and Jayanthi Bhasin, 1985). The present result

would be useful to plan future studies on management of important diseases and their behaviour in different crops in various farming systems.

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Table 1 Foliar fungal disease in different farming systems (Umiam, 1000 mamsI)

Farming system and crop/ tree species	Disease	Casual agent	PDI
(1)	(2)	(3)	(4)
W ₁ Guinea grass <i>Panicum maximum</i> Jacq.)	Leaf spot	<i>Bipolaris sacchari</i> (Butler) Subram. & Jain	23.35
W ₂ <i>Michelia ablenga</i> Wall ex Hook. P.& Thomas <i>Artocarpus lacucha</i> A. Cunn.	Leaf spot i. Powdery mildew	<i>Phoma</i> sp. <i>Oidium</i> sp. ii. Seety mould	21.22 30.44
<i>Capnodium</i> sp. <i>Symingtonia populnea</i>	Leaf spot	<i>Coletetrichum gloeosporioides</i> (Penz.) Penz. & Sacc.	18.66
W ₃ Guinea grass <i>S. populnea</i> <i>Ficus hookerii</i> Mig. Bouhinia variegata Syn. B. Candida Rexb.	Leaf spot Leaf spot Leaf & blight Leaf blight	<i>B. sacchari</i> <i>C. gloeosporioides</i> <i>C. gloeosporioides</i> Carospora baohintoo H.& P. Sydow	20.23 15.33 40.44 56.54
W ₄ Guinea grass Broom grass (<i>Thysaneneana maxima</i> Roxb. Kuntze.)	Leaf spot i. Brown leaf spot ii. Leaf spot	<i>B. sacchari</i> <i>Bipolaria</i> sp. <i>Fusarium</i> sp.	36.4 28.88 25.33

(1)	(2)	(3)	(4)
	mustard (<i>Brassica juncea</i> (Coss.)	<i>Alternaria brassicae</i> (Berk.) Sec.	83.11
	Ginger (<i>Zingiber officinale</i> Resc.)	<i>Fusarium oxysporum</i> Schiecht emend Snyder and Hansen	19.20
W ₅	Ginger	<i>F. oxysporum</i>	14.40
	groundnut (<i>Arachis hyperglon</i> L.)	<i>Cercospora arachidicola</i> Hori	84.22
	Radish	<i>A. brassicae</i>	48.77
	Guinea grass	<i>B. sacchari</i>	25.44
	Broom grass	<i>Bipolaris</i> sp.	24.23
	<i>F. hookerii</i>	<i>Cylindrosporum</i> sp.	23.88
W ₆	Radish	gloeosporioides	83.88
	<i>A. nepalensis</i>	<i>A. brassicae</i>	44.44
		<i>Oidium</i> sp.	23.56
		<i>Capnodium</i> sp.	23.56
		<i>C. gloeosporioides</i>	83.21
W ₈	<i>Mitcheha champaca</i> L	<i>Phoma</i> sp.	21.23