

Pak. j. sci. ind. res., vol.37, no.9, September 1994

## Seed-borne Fungi of Wheat Cultivars in Pakistan

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(Received October 24, 1993 ; revised April 7, 1994)

Total of 1267 seed lots of different wheat cultivars collected from different locations of Pakistan were studied for their health by using ISTA techniques. Important pathogens isolated were *Drechslera sorokiniana*, *Fusarium moniliforme*, *Cephalosporium acremonium* and *Fusarium graminearum*. Presence of *Fusarium semitectum*, *Alternaria* spp. *Penicillium* spp. and *Aspergillus* spp. as saprophytes necessitate the needs of proper storage facilities.

Wheat (*Triticum aestivum*) is the most important cereal crop of Pakistan and is cultivated over 78.4 m hectare with

an average yield of 1825 kg/ha [1]. Despite the development of high yielding varieties and improved cultural practices, diseases still play a significant role in reducing the productivity of wheat crop.

The important seed-borne diseases of wheat are; Loose smut (*Ustilago tritici*), Karnal bunt (*Tilletia indica*), Flag smut (*Urocystis tritici*), Foot-rot (*Fusarium moniliforme*), Leaf spot (*Alternaria triticina*) and Leaf blight (*Drechslera sorokiniana*) [2]. Total of 1267 seed lots from 12 locations and 25 wheat cultivars were tested during 1985-90, at Federal Seed Certification Department, Islamabad.

Standard blotter method, a prescribed method for seed health testing by ISTA [3] was used. Two hundred seeds distributed @ 25 seeds per petri plate were incubated at 20°± 2 for 7 days.

Fungi growing from seeds were identified earlier [4-6]. Important seed-borne fungi isolated from seed lots are presented in Table 1. *Drechslera sorokiniana* was isolated in

TABLE 1. INCIDENCE OF SEED-BORNE FUNGI IN SEED LOTS OF DIFFERENT WHEAT CULTIVARS IN PAKISTAN DURING 1985-90.

Cultivars	Samples tested	<i>Drechslera sorokiniana</i>	<i>Fusarium moniliforme</i>	<i>Cephalosporium acremonium</i>	<i>Fusarium graminearum</i>
		A	A	A	A
Lyp-73	56	22 (0.5-7.5)	21 (0.5-7.5)	21 (0.5-4.5)	1 (0.5)
Pak-81	510	121 (0.5-6.5)	116 (0.5-10.0)	71 (0.5-26.5)	12 (0.5-1.5)
B/silver	178	69 (0.5-26.5)	28 (0.5-2.0)	24 (0.5-4.0)	— —
LU-26	8	2 (0.5-22.5)	3 (0.5-1.0)	2 (0.5-1.5)	— —
Sarhad	3	2 (0.5-3.5)	1 (0.5)	—	— —
Sandal	4	—	1 (0.5)	1 (0.5)	— —
Pari-73	3	—	1 (0.5)	2 (0.5-1.0)	— —
Pb-81	87	18 (0.5-4.0)	16 (0.5-7.5)	17 (0.5-4.0)	1 (1.0)
Bwp-79	19	9 (0.5-10.5)	3 (0.5-2.0)	2 (0.5-4.0)	1 (2.5)
K-noor-83	19	8 (0.5-27.0)	6 (0.5-1.5)	4 (0.5-5.5)	— —
Pavon	45	1 (0.5)	25 (0.5-2.5)	15 (0.5-3.6)	— —
ZA-77	28	2 (0.5)	9 (0.5-2.0)	7 (0.5-1.0)	— —
FD-83	85	30 (0.5-10.5)	19 (0.5-4.5)	9 (0.5-2.5)	— —
Jauhar-78	9	—	3 (0.5-1.0)	—	— —
Sindh-81	4	—	1 (0.5)	—	— —
T.J-83	28	5 (0.5-2.5)	7 (0.5-1.0)	2 (1.5-2.0)	— —
Barani-78	3	2 (8.5-21.0)	2 (0.5)	—	2 (2.0)
Pirsabak-85	39	24 (0.5-17.0)	14 (0.5-6.5)	5 (0.5)	6 (0.5-2.5)
Sarsabz	16	3 (0.5)	9 (0.5-1.5)	—	— —
Pb-85	80	14 (0.5-8.5)	7 (0.5-1.5)	3 (0.5)	— —
Pb-83	1	1 (1.5)	—	—	— —
FD-85	37	8 (0.5-4.0)	5 (0.5-4.5)	1 (3.0)	1 (0.5)
K-noor-87	4	4 (3.0-5.5)	—	—	1 (1.0)
Zamindar	1	1 (0.5)	—	—	— —
Zarghoon	1	1 (0.5)	1 (1.0)	—	— —

A = Number of samples infected. Number in parenthesis indicate infection range.



27.3%, *Fusarium moniliforme* in 23.25%, *Cephalosporium acremonium* in 14.68% of the samples tested. *Drechslera sorokiniana* showed a maximum infection of 27.0% in variety Kooh-i Noor-83, *Fusarium moniliforme* showed a maximum infection of 10% in Pak-81, *Cephalosporium acremonium* was recorded in Pak-81 with a maximum infection of 26.5%. Besides *Fusarium semitectum*, *Penicillium* spp, *Alternaria* spp, and *Aspergillus* spp were also isolated from the seed lots tested. Damage done by these fungi in Pakistan is not known which needs investigations.

The importance of seed testing to control plant diseases, which are seed-borne, has been emphasized [7]. The use of chemical seed treatment to improved quality for planting has been reported by Akhtar and Khokhar [8], Klein and Burgees [9] and Singh and Saksena [10].

Keeping in view the presence of fungal pathogens in wheat seed lots, there is a need to treat the seed with suitable fungicide at pre-basic, basic and certified levels to control plant diseases. Presence of saprophytic fungi in higher number necessitates the need for proper storage in maintaining the seed quality.

**Key words:** Seed-borne fungi, Wheat, Blotter method.

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Cultivar	Samples tested	<i>Drechslera sorokiniana</i>	<i>Fusarium moniliforme</i>	<i>Cephalosporium acremonium</i>	<i>Fusarium semitectum</i>
Lyp-75	26	22 (0.2-7.3)	21 (0.2-7.7)	21 (0.2-4.2)	1 (0.2)
Pak-81	210	121 (0.2-6.2)	116 (0.2-10.0)	71 (0.2-26.2)	12 (0.2-1.2)
Bahar	178	69 (0.2-26.2)	28 (0.2-2.0)	24 (0.2-4.0)	-
L.O-26	8	2 (0.2-2.2)	3 (0.2-1.0)	2 (0.2-1.2)	-
Sahab	3	2 (0.2-2.2)	1 (0.2)	-	-
Sandai	4	-	1 (0.2)	1 (0.2)	-
Pak-75	3	-	1 (0.2)	2 (0.2-1.0)	-
Pak-81	87	18 (0.2-4.0)	16 (0.2-7.2)	17 (0.2-4.0)	1 (1.0)
Bwp-79	19	9 (0.2-10.2)	3 (0.2-2.0)	3 (0.2-4.0)	1 (2.2)
K-noor-83	19	8 (0.2-2.0)	6 (0.2-1.2)	4 (0.2-2.2)	-
Favon	42	1 (0.2)	22 (0.2-2.2)	12 (0.2-3.0)	-
ZA-77	28	2 (0.2)	9 (0.2-2.0)	7 (0.2-1.0)	-
FD-83	82	30 (0.2-10.2)	19 (0.2-4.2)	9 (0.2-2.2)	-
Jandur-78	9	-	3 (0.2-1.0)	-	-
Sindh-81	4	-	1 (0.2)	-	-
T-1-83	28	2 (0.2-2.2)	7 (0.2-1.0)	2 (1.2-2.0)	-
Bano-78	3	2 (8.2-21.0)	2 (0.2)	-	2 (2.0)
Bansak-82	29	24 (0.2-17.0)	14 (0.2-6.2)	2 (0.2)	6 (0.2-2.2)
Suez	16	3 (0.2)	9 (0.2-1.2)	-	-
Pak-82	80	14 (0.2-8.2)	7 (0.2-1.2)	3 (0.2)	-
Pak-83	1	1 (1.2)	-	-	1 (0.2)
FD-82	27	8 (0.2-4.0)	2 (0.2-4.2)	1 (2.0)	1 (1.0)
K-noor-87	4	4 (3.0-2.2)	-	-	-
Zandur	1	1 (0.2)	-	-	-
Zargoon	1	1 (0.2)	1 (1.0)	-	-

A = Number of samples infected; Number in parentheses indicate infection range