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Efficacy of some Fungicides on Incidence of Seed-Borne Fungi of Setaria Italica Beauv. Grown in Almora Hills*

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Six fungicides were employed by dusting the seeds (0.3% w/w) of *Setaria italica* to observe their effect on seed mycoflora. Dithane M-45, Agrosan G. N. and Dithane Z-78 reduced most of the prevalent fungi significantly associated with the grains, whereas, Benlate Blitox 50 and Diflolatan were not much effective. The per-cent seed germination was found to be increased in all the treatments as compared to control.

Setaria italica, Commonly known as 'Kauni' in the hills of Kumaun, is an important crop of this region. Fungicidal treatments are known to reduce the seed mycoflora and improve seed germination and sprouting. (Grewal and Kapoor, 1966; Dharam Vir *et. al.*, 1970). Very little work has been done on this aspect in this crop so far (Grewal and Mahendra Pal, 1965).

The present investigation quantifies our knowledge on the per cent occurrence of seed mycoflora of a high altitude crop and its control by means of fungicides.

MATERIAL AND METHODS

Seeds of *Setaria italica* were collected from ten different villages situated at various altitudes in Almora Hills in the month of April, 1979, for the present study. The collected seeds were stored by the villagers for six months in earthenware pots or in wooden-boxes made up of pine woods pasted with clay on both the inner and outer surfaces. Six fungicides viz. Agrosan GN, Benlate. Blitox-50, Dithane Z-78, Dithane M-45 and Difolatan, were applied to the seeds at the rate of 0.3% by seed weight. The seeds thus treated were shaken in separate flasks with the help of a mechanical shaker for 15 minutes and then kept in the laboratory at room temperature for 48 hrs. The seeds without fungicidal treatments served as control. Ten seeds from each flask were transferred to each of the petri dishes having moist-tri-layered blotting papers and PDA seperately. In all 400 seeds employed for each treatment were incubated at $25 \pm 2^{\circ}C$ temperature under an alternate cycle of 12hr NUV light and 12hr darkness. The microfungi associated with the seeds were screened microscopically after 7 days of incubation.

RESULTS AND DISCUSSION

In all, nineteen fungal species were isolated from the seeds of *Setaria italica* by PDA and standard blotter test methods as necommended by International Seed Testing Association, (1966).

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It is evident from the Table 1 that Agrosan GN. Dithane M-45 and Dithane Z-78 were found to inhibit the growth of some prevalent fungal species significantly. Agrosan GN checked the growth of *Rhizopus nigricans, Mucor hiemalis, Chaetomium piluliferum, Aspergillus flavus, A. niger, Alternaria alternata, Curvularia lunata, Dreshslera biseptata, Drechslera bicolor, Epicoccum purpurescens, Fusarium moniliforme* and *Torula graminis* completely and inhibited the growth of the rest of the mycoflors from 76 to 85% Dithane M-45 checked 13 mycoflora completely and reduced the growth of the rest of the fungi from 30 to 92.5%. Dithane Z-78 gave a complete control of 11 associated fungi and the rest 8 were inhibited from 45 to 95%. Three fungicides viz., Benlate, Blitox 50 and Difolaton were found to be comparatively less effective. The agar plate method exhibited similar results with little deviation. The per cent seed germination in all the treatments were found to be enhanced as compered to the untreated seeds.

Among all the six fungicides tested, Agrosan GN, Dithane M45 and Dithane Z-78 were found to control most of the mycoflora significantly. Earlier workers have also reported the control of seed mycoflora of *Setaria italica* and *Eleusine coracana* by Agrosan GN (Grewal and Mahendra Pal, 1965; 1963). Dithane M-45 has been reported to give a compltete check of seed-borne infection of Drechslera spp. on barley, rice and oat (Dharam Vir *et al*, 1970). Dithane M-45 Unizeb and Cupramar have been observed to be most effective in controlling the seed-borne mycoflora of barley (Rai and Sing, 1976; Tandon and Dwivedi. 1977). The foregoing results conclusively indicate that Dithane M-45, Dithane Z-78 and Agrosan GN may be recommended for the control of seed mycoflora of *Setaria italica* grown in this region. In addition, these fungicides have got no any adverse effect on the germination and sprouting of the seeds. The enhancement in per-cent seed germination indicates a favourable effect of the treatments on the viability of the seeds.

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TABLE 1 Effect of fungicidal treatments on the percentage incidence of fungi associated with the seeds of *Setaria Italica*

Name of the Fungal Species	Blotter Method							Agar Plate Method						
	Cw	A	B	C	D	E	F	Cp	A	B	C	D	E	F
Rhizopus nigricans	38	–	–	–	7	–	5	68	5	7	–	6	–	8
Mucor hiemalis	7	–	–	2	–	–	–	18	–	–	8	–	6	12
Chaetomium piluleferum	12	–	5	6	–	–	3	7	–	–	–	–	–	6
Aspergillus flavus	10	–	5	–	–	–	–	26	–	15	–	6	6	7
Aspergillus niger	20	–	2	16	2	–	12	38	7	6	16	7	–	–
Alternarsia alternata	30	–	12	–	10	6	–	45	–	–	–	–	–	8
Cladosporium cladosporoides	45	7	16	20	–	–	5	47	5	18	12	–	12	12
Cladosporium oxysporum	59	10	–	12	–	7	–	36	2	–	5	6	–	17
Curvularia lunata	40	–	–	–	20	–	–	32	–	16	10	4	8	14
Drechslera biseptata	28	–	12	–	15	–	17	19	–	12	7	–	5	–
Drechslera bicolor	40	–	6	–	4	5	6	31	–	–	–	–	–	–
Drechslera rostrata	32	8	7	18	–	–	–	20	10	–	8	–	–	–
Epicoccum purpurescens	20	–	2	–	–	–	8	12	–	–	6	3	–	6
Fusarium moniliforme	18	–	8	12	10	–	15	24	–	6	–	5	–	6
Gilmanielia humicola	20	5	12	10	–	7	–	10	8	--	--	7	6	--
Penicillium granulatum	40	8	--	13	15	--	12	23	–	18	12	--	--	--
Phoma hibernica	34	6	–	16	--	--	--	10	–	–	--	2	7	--
Torula graminis	10	--	--	6	--	7	8	7	–	--	3	10	--	--
White sterile mycelium	36	6	--	17	--	12	--	48	6	7	13	--	--	6

Cw=Control in water soaked blotter, Cp=Control in PDA, A=Agrosan GN, B=Benlate, C=Blitox 50, D=Dithane Z-78, E=Dithane M-45, F=Difolatan.