

SOME STUDIES ON THE REACTION OF WHEAT VARIETIES TO LOOSE SMUT, *USTILAGO TRITICI* (PERS.) ROSTR.

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Although hot water seed treatment (Jensen, 1888) and solar energy treatment (Luthra & Sattar, 1934) are effective in the control of loose smut (*Ustilago tritici*) infection but the ideal method for the control of the disease is the use of resistant varieties. During the breeding of resistant varieties, field test gives results after a year. The embryo test, however, is a quicker and simpler method to detect the presence of the fungus in the embryo of the seed (Simmonds, 1946; Skortzoff, 1957), although some varieties are embryo susceptible but field resistant (Popp, 1951; Ohms & Bever, 1955; Batts & Jeater, 1958; Soomro & Malik, 1966; Basit & Malik, 1967). The previous studies on the behaviour of some local wheat varieties to loose smut revealed a close correlation between percentage infection in susceptible varieties by field and embryo test (Soomro & Malik, 1966). Variety H 23-42 in these studies was found to be field resistant but embryo susceptible. The present work is an extension of the previous work.

Materials and Methods

Inoculation of 28 local and foreign wheat varieties were made with the loose smut collected from the wheat variety C-591 growing at the Agricultural Research Institute, Tandojam, in a manner previously described (Soomro & Malik, 1966). At least 10 ears of each variety were inoculated at anthesis stage by partial vacuum method (Moore, 1936). Grains were collected at maturity and germination percentage was calculated to determine the effect of inoculation on the viability of wheat seeds. The remaining seeds were tested for smut resistance by field and embryo test described earlier (Simmonds, 1946; Soomoro & Malik, 1966).

Results and Discussion

Results are summarized in Table 1, which indicate that maximum germination of wheat seeds occurred in variety Bonza-63 and the minimum in H 23-42, the average germination percentage being 86.6.

None of the variety was found free from infection in both field and embryo test, although H 23-42 was found to be field resistant but embryo susceptible. There was very close correlation between field and embryo test. In wheat varieties tested the average infection being 55.6% and 56.7% respectively, as observed in the embryo and field tests, a situation previously noted in some local wheat varieties.

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TABLE 1. Germination of seeds and infection of wheat varieties to loose smut as obtained by field and embryo tests.

Wheat varieties	Percentage germination	Percentage loose smut infection	
		Field test	Embryo test
C-591	84.4	42.3	42.2
Rachna	89.4	47.7	48.5
C-306	83.6	48.7	50.4
Raque-66	90.8	51.2	48.0
Huelqman	92.0	51.6	50.1
Tripple Dirk	81.1	52.0	51.5
Noreste-66	91.2	52.8	50.2
Giza-144	88.7	52.6	54.2
5725	88.8	53.0	51.6
Chanab	91.0	53.3	50.1
India-66	90.8	54.0	52.0
Bonza-63	95.3	54.6	55.4
Giza-150	93.6	54.4	53.1
N.P-880	94.4	54.5	52.3
N.P-832	55.8	56.5	56.6
Napo-63	87.1	56.5	54.2
Taccuari	84.5	56.8	56.8
Pitic-62	95.0	57.8	56.8
Larma Rajo-64 A	85.5	57.8	55.5
N.P-824	86.6	58.4	54.2
Sanora-64	89.8	61.7	64.4
Crespo-63	95.4	63.1	61.5
15-13-2	85.4	68.4	69.2
15-13-5	77.7	64.1	66.8
Carazino	88.2	66.2	64.2
15-13-1	90.4	70.5	74.3
Tiba-63	86.2	90.0	96.0
H 23-42	53.9	00.0	40.4

The results are consistent with previous findings by the author and other workers Popp (1951), Ohms & Bever (1955). The decrease in viability of wheat seeds by infection may be attributed to the injury caused to the embryo during the process of inoculation.

Present findings show that none of the varieties were immune to loose smut except H 23-42 which is field resistant but embryo susceptible. Most likely the mycelium present in the scutellum of the embryos of this variety is prohibited to grow further to produce an infected plant. Similar resistance was recorded for spring wheat and kawale wheat varieties by Popp (1951) and Ohms & Bever (1955) respectively.

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