

Effect of Sowing Date on Infection of Indian Wheat Varieties with Loose Smut and Seed Gall Nematode

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Abstract

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All 25 wheat varieties tested except WH896 and Raj1555 were susceptible to loose smut, with disease incidence ranged from 16.7% to 43.5%. Following a 35 days delay in seed sowing, all tested varieties expressed reduction in loose smut incidence, whereas seed gall nematode/ear cockle incidence was increased in most varieties.

Key words: *Ustilago segetum* var. *tritici*, *Anguina tritici*

Introduction

Simultaneous occurrence of wheat loose smut caused by *Ustilago segetum* var. *tritici* and wheat seed gall nematode/ear cockle caused by *Anguina tritici* has been reported in wheat by various workers (1, 2, 3). This type of association between *Anguina tritici* and *Ustilago segetum* var. *tritici* with different incidence levels on different wheat varieties cultivated in India has been observed. In this study, an attempt to evaluate the effect of concomitant occurrence of loose smut and ear cockle on different varieties at different sowing dates was made.

Materials and Methods

A field experiment was conducted at CCSHAU-Hisar plant pathology research area during 1997/1998, 1998/1999 and 1999/2000 wheat growing seasons. Each subplot included 6 furrows of 2 meters long and 15 cm apart with three replications for each treatment. Twenty-five varieties inoculated with loose smut spores in the previous crop season were sown. In each furrow, 20 seeds with gall nematode were also sown for all sowing dates on 25 November, 15 December and 30 December. Subplots were separated by 1-meter distance. Disease incidence was recorded on tiller basis for each variety. Tillers with loose smut and gall nematode were counted separately for both diseases.

Results and Discussion

It was noticed that two thirds of the ears, particularly the lower part, were totally transformed into black sori of the loose smut fungus. The upper portion of the ears was infected by the gall nematode, and black galls were clearly visible from distended glumes. All varieties except WH 896 and Raj 1555 were susceptible to loose smut and the incidence ranged from 16.7% to 43.5%. The delay in seed sowing reduced the loose smut incidence of all susceptible cultivars (Table 1). In the highly susceptible variety Sonalika, disease incidence was decreased from 43.5% to 30.8%. This effect could be due to reduction in spore germination or mycelial inactivation because of lower

temperature. Conversely, gall nematode incidence was increased in most varieties when sowing was delayed. Pruthi and Gupta (3) reported earlier that presence of the fungus with nematode had an adverse effect on the number, motility and development of the nematode larvae at normal sowing time. It can be concluded that delayed sowing can in general reduce loose smut incidence, but increase infection with the gall nematode.

Table 1. Effect of sowing date on the infection of Indian wheat varieties/cultivars with loose smut and seed gall/ear cockle.

Variety/ cultivar	25 November		15 December		30 December	
	LS*	SGN	LS	SGN	LS	SGN
C306	37.3	17.5	34.0	28.7	27.7	33.1
Sonalika	43.5	17.1	38.5	23.8	30.8	39.2
WH147	39.8	18.6	31.4	25.9	28.4	31.1
WH157	35.3	21.3	29.4	28.8	24.3	40.3
WH283	38.7	17.4	32.4	24.7	23.7	29.4
WH291	36.1	18.1	30.2	24.8	21.3	31.4
WH416	35.0	15.0	28.1	20.4	20.8	26.7
WH533	31.2	22.9	26.7	29.8	20.7	35.3
WH542	32.3	21.0	28.1	27.3	21.3	33.3
WH896	0.0	11.4	0.0	16.2	0.0	1.6
Sonak	31.7	22.8	24.3	30.2	18.8	38.8
HD2009	38.8	20.9	29.3	27.7	23.4	34.6
HD2285	36.5	24.8	26.8	30.8	19.8	41.3
HD2329	30.0	18.3	22.2	24.8	16.7	31.0
HD2687	36.7	18.2	29.8	23.8	23.7	28.7
PBW175	31.4	18.8	26.8	26.4	21.7	31.9
PBW343	39.5	14.8	29.8	22.4	21.8	29.8
PBW373	33.3	18.7	26.7	24.2	20.2	30.6
PBW435	37.7	20.0	29.3	26.7	23.7	32.2
RAJ1555	0.0	14.3	0.0	18.2	0.0	23.3
RAJ3077	36.7	16.7	28.8	24.8	22.2	30.3
RAJ3765	34.4	18.2	27.7	23.7	21.3	29.3
RAJ3777	32.3	20.3	25.2	26.7	19.7	32.7
UP2338	33.8	19.1	26.8	25.7	20.4	31.3
UP2425	36.7	18.4	28.3	24.3	22.2	29.7
LSD at	2.54	1.95	1.92	2.32	2.62	2.16
P= 0.05						

* LS= Loose smut incidence, SGN= Seed gall nematode/ear cockle incidence

الملخص

سينج، راجيندر، م.س. بينيوال وس.س. كارواسرا. 2007. تأثير تاريخ الزراعة في إصابة أصناف القمح الهندية بالتفحم السائب ونيماطودا تتأكل الحبوب. مجلة وقاية النبات العربية، 25: 183-184.

جميع أصناف القمح الـ 25 المختبرة عدا الصنفين WH 896 و RAJ 1555 كانت حساسة للإصابة بالتفحم السائب، وتراوحت نسبة الإصابة ما بين 16.66% و 43.52%. عند التأخير في موعد الزراعة لمدة 35 يوماً، أبدت جميع الأصناف المختبرة انخفاضاً في نسبة الإصابة بالتفحم السائب، في حين ازدادت نسبة الإصابة بنيماطودا تتأكل الحبوب في معظم الأصناف.

كلمات مفتاحية: *Anguina tritici*, *Ustilago segetum* var. *tritici*.

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