AN UPDATE ON WHEAT STREAK MOSAIC VIRUS IN NORTH DAKOTA

R.G. Timian and H.A. Lamey

Wheat streak mosaic (WSM), a virus disease caused by wheat streak mosaic virus and vectored by the wheat curl mite (*Eriophyes tulipae* Keifer), is becoming a concern in areas other than the traditional winter wheat areas in North Dakota. Severe losses to this disease have been reported in winter and spring wheats (1, 3, 4, 5) and tolerance to the disease was reported by several researchers (1, 3, 4). No information is available on the reaction of durum wheats, which are grown extensively in the eastern part of North Dakota.

Our study was prompted by the need for information on the reaction of durum cultivars to WSM and the trend toward increasing plantings of winter wheat (an overwintering host for WSM) in eastern North Dakota. Wheat streak mosaic virus (WSMV) was isolated from spring wheat and corn in eastern North Dakota in 1984. The virus had not been identified in this area during the past 10 years.

MATERIALS AND METHODS

The commercial durum cultivars Ward, Vic, Lloyd and Cando and recently released hard red spring wheat cultivars Marshall, Oslo, Stoa, PR 2369, Guard and Alex, and two check cultivars, Olaf (susceptible) and Butte (tolerant) were inoculated with WSMV under field conditions in 1984 at Fargo. The cultivars were planted in paired four-row plots and randomized in four replications. The two center rows of one of the paired plots were mechanically inoculated when the plants were in the first leaf stage. Escape plants were inoculated a second time five weeks following the first inoculation.

Symptoms were recorded at weekly intervals starting two weeks post inoculation until plants neared maturity. Yield was measured by harvesting the two infected rows and the two center rows from the noninoculated checks respectively. Thousand kernel weights were determined by weighing 1000 kernels from each plot.

Timian is USDA Research Plant Pathologist and Lamey is Extension Plant Pathologist. *The authors would like to acknowledge the assistance of Kerman Alm, Agricultural Technician, for his help in making these studies.*

RESULTS AND DISCUSSION

Differences in yellowing and stunting were observed among cultivars. The symptoms observed in plants two weeks post inoculation did not necessarily correspond with the severity of symptoms in plants at heading. However, cultivars most reduced in yield showed severe symptoms at two weeks post inoculation.

The yields of all cultivars of hard red spring and durum wheats were reduced significantly when inoculated with WSMV (Table 1). Butte, which was reported to be WSMV tolerant in earlier studies (1), was again the most tolerant of the hard red spring wheat cultivars tested. Yield losses in the eight hard red spring cultivars ranged from 32 percent and 34 percent for Butte and Oslo to 58 percent for Stoa. Thousand kernel weight was reduced significantly in all cultivars tested.

Average yield losses were less (36 percent) in the durum cultivars than in the hard red spring wheat cultivars (46 percent). Losses ranged from 22 percent to 49 percent in Ward and Lloyd, respectively. Kernel weight was not affected as severely in the durum cultivars (3-4 percent) as it was in the hard red spring cultivars (8-18 percent).

The better choices for spring wheat cultivars, if conditions are favorable for WSM development, are Butte and Oslo. Stoa, Alex and Marshall would not be good choices. Ward and Vic would be the better choices of the durum cultivars.

Cultural practices that will help in the control of the WSM disease have been published in extension circular PP-646 (2). Utilization of good cultural practices and growing tolerant cultivars will reduce losses to WSMV.

LITERATURE CITED

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daughters. These differences have been identified in a problem-solving context. A child who receives verbal instruction from two different sources (mothers and fathers) may develop more flexible verbal and problem-solving strategies which would be beneficial in a variety of educational settings.

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Table 1. The yield and thousand kernel weight of virus free and WSMV infected spring and durum wheat cultivars in field trials at Fargo, ND, 1984.

Cultivar	Yield bu/A virus free control	Yield bu/A WSMV inoculated	Yield reduction %	1000 K W (gm) virus free control	1000 K W (gm) WSMV inoculated	Weight reduction %
SPRING WHEAT						
Butte	59.2	40.4**	32 a[1]	29.5	26.6**	10 a[1]
Oslo	61.0	40.4**	34 a	31.0	26.2**	15 b
PR 2369	64.9	35.5**	45 b	29.4	25.0**	15 b
Olaf	56.0	29.6**	47 bc	31.2	28.2**	10 a
Guard	63.3	32.9**	48 bc	30.7	27.4**	11 a
Marshall	54.4	26.3**	52 bc	25.1	20.8**	17 bc
Alex	65.4	28.5**	56 bc	30.9	28.5*	8 a
Stoa	67.0	28.5**	58 c	29.3	24.1**	18 c
	LSD for yield 5% - 10.2 1% - 13.9			LSD for Kernel weight 5% - 1.89 1% - 2.557		
DURUM WHEAT						
Ward	65.4	50.8**	22 a[1]	38.9	36.0**	3 a[1]
Vic	66.4	47.5**	29 a	44.5	40.5**	4 a
Cando	63.3	36.2**	43 b	39.6	35.2**	4 a
Lloyd	70.0	26.6**	49 b	30.8	26.6**	4 a
	LSD for yield 5% - 7.5 1% - 10.6			LSD for Kernel weight 5% - 1.98 1% - 2.774		

[1] Means separated by a different letter differ significantly (P = .05).

*,** Significant at the .05 and .01 level, respectively, as indicated by the paired t test.

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CORRECTION

R.G. Timian, author of "An Update on Wheat Streak Mosaic Virus in North Dakota" which appeared in the March-April 1985 issue, has discovered some errors were made in preparation of the manuscript and not detected until after publication. The table below contains the correct figures.

Table 1. The yield and thousand kernel weight of virus free and WSMV infected spring and durum wheat cultivars in field trials at Fargo, ND, 1984.

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DURUM WHEAT						
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Cando	63.3	36.2**	43 b	39.6	35.2**	13 a
Lloyd	70.0	36.6**	48 b	30.8	26.6**	14 a
	LSD for yield 5% - 7.5 1% - 10.6			LSD for Kernel weight 5% - 1.98 1% - 2.774		

[1] Means separated by a different letter differ significantly (P = .05).

*,** Significant at the .05 and .01 level, respectively, as indicated by the paired t test.