



Keeping
Up With
Research
26

JULY 1976

Controlling Soilborne Wheat Mosaic¹

C. L. Niblett, W. G. Willis and E. G. Heyne²

Soilborne wheat mosaic (SBM) was first reported in Kansas in 1952 along the Missouri River and in southeast Kansas. Now it is found as far west as Garden City, but it is most prevalent and destructive in southeast and south-central Kansas. Statewide losses were estimated at 15 million bushels in 1975, and greater losses are expected in 1976.

Symptoms of SBM include a general yellowing of the wheat plant, irregular dark green "islands" or spots on the light yellow background, a general stunting and reduced vigor. The disease often occurs in irregular patches in low, wet areas but it may infect whole fields.

1. Information in this report is for farmers, producers, colleagues, industry cooperators, and other interested persons. It is not a recommendation or endorsement.

Contribution Nos. 657-S, Department of Plant Pathology and 1581-S, Department of Agronomy, Kansas Agricultural Experiment Station, Manhattan, Kansas 66506.

2. Research plant pathologist, research and extension plant pathologist, and small grains research geneticist, respectively, AES, KSU.

AGRICULTURAL EXPERIMENT STATION

Kansas State University, Manhattan

Floyd W. Smith, Director

Symptoms are most prominent in early spring with cool weather and abundant moisture. Prolonged warm periods (above 60°F) make the symptoms less apparent. Although symptoms disappear, yields are severely reduced (Table 1). Losses are greatest when symptoms remain into late April with prolonged cool, damp weather. The infected wheat plants are stunted, tillering is reduced and maturity delayed. Reduced growth of the infected wheat plants permits annual weeds like mustard and henbit to develop rapidly and compete for moisture and nutrients.

SBM is caused by a virus (soilborne wheat mosaic virus) that is carried or vectored by a fungus, *Polymyxa graminis*. The fungus lives in the soil and can survive at least 10 years in dry soil. Therefore, even prolonged crop rotation does not eliminate the disease. The only practical control for SBM is to plant resistant varieties. Several are available (Table 2) and others are about to be released. There appear to be two types of resistance to SBM. Some varieties show few or no symptoms. However, others like Centurk and Gage show obvious symptoms, but still yield well. Both types of resistance are useful and both are being used in breeding programs.

Growers should consult county extension agents to determine highest yielding resistant varieties in their locale. Certified seed is scarce and arrangements for it should be made early.

Table 1.—Effect of SBM on Wheat Yield¹

Variety	SBM Response ²	Yield (Bu/A)
Centurk	R	42
Satanta	R	39
Shawnee	R	39
		Avg. 40
Eagle	S	20
Parker	S	27
Scout	S	17
Triumph 64	S	25
		Avg. 22

Average Yield Reduction 18 Bu/A

1. Based on research at Newton, KS, 1973 and 1975.

2. R = resistant, S = susceptible.

Table 2.—Reactions of Wheat Varieties to SBM*

Variety	SBM Reaction**
RESISTANT:	
Buckskin	3
Centurk	3
Chanute	1
DeKalb 571	2
DeKalb 583	1
DeKalb 586	1
Gage	4
Homestead	2
Lancota	3
Pioneer HR901	2
Pioneer HR915A	3
Plainsman V	1
Satanta	1
SUSCEPTIBLE:	
Caprock	8
Cloud	8
Danne	7
Eagle	8
Kirwin	7
Osage	8
Parker	7
Sage	8
Scout	9
Sturdy	8
TAM W-101	8
Trison	8
Triumph 64	5

* Based on yield tests or observations.

** 1 = highly resistant (damage not apparent),
9 = highly susceptible (severely damaged).