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Controlling Wheat-Streak Mosaic

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Wheat streak mosaic is a destructive and well-known disease of wheat. It is caused by a virus, wheat streak mosaic virus (WSMV). The virus is carried (or vectored) by a microscopic mite. This disease is always present in Kansas, and its severity depends on conditions of the previous year such as hail incidence and survival of volunteer wheat. Severest damage in Kansas was in 1949 and 1959 when losses were 20 and 40 million bushels, respectively. Losses in 1972 were 15 million bushels and the disease approached record severity in 1974.

Losses due to wheat streak mosaic can be effectively controlled by the following cultural methods:

- 1) **Destroy volunteer wheat.** This is the most important control method. It is effective because mites and virus require volunteer wheat to survive the summer. Fall winds blow the virus-containing mites from volunteer to seeded wheat. Destroying volunteer wheat kills the mites and eliminates WSMV. In fields to be seeded, volunteer wheat should be destroyed

Information in this report is for farmers, producers, colleagues, industry cooperators, and other interested persons. It is not a recommendation or endorsement and represents only two years of research.

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three weeks before planting. In fields adjacent to those to be seeded, volunteer wheat should be destroyed at least 1-2 weeks before planting. In addition to wheat, buffalograss, millet, and corn can harbor mites and the virus.

2) **Plant as late as practical.** Mite populations decline in the fall so less late-seeded wheat will be infected. Also, late infected wheat will be less severely damaged because the virus has less time to multiply before winter. Late planting also reduces damage by hessian fly.

3) **Fertilize adequately and conserve moisture.** Vigorous plants with adequate nutrients and moisture withstand WSMV infection better than weak plants.

4) **Plant tolerant or resistant wheat varieties.** Wheat varieties differ markedly in their response to WSMV infection. Yields of Eagle, Scout, and Triumph are reduced much less than yields of Bison, Centurk, and Parker. Table 1 shows average yield reductions of indicated varieties in two years of inoculated test plots at Hays and Manhattan.

The 1974 tests of 41 breeding lines and varieties indicate that Eagle and most other Scout-derived varieties and Triumph are less damaged by WSMV, whereas Buckskin, Caprock, Centurk, Hi Plains, Homestead, Kirwin, Parker, Sentinel, Shawnee, and Sturdy are severely damaged.

Table 1. Average yield reductions in wheat varieties by WSMV

Variety*	% yield reduction**
Bison	20.2
Centurk	20.5
Eagle	6.4
Parker	15.5
Triumph	11.4

* Scout was not included in 1972 and 1973 tests, but is in the 1974 tests.

** Compared with untreated plots. Four plots were used for each variety and treatment.

Note: Plots were treated (inoculated) with a paint sprayer-like apparatus when wheat plants were quite large. Therefore, yield reductions reported are probably less than would be expected with earlier natural (mite) inoculation.