

Impact of *Wheat Streak Mosaic Virus* on Crop Water Use Efficiency in Irrigated Wheat

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BACKGROUND

Wheat streak mosaic virus (WSMV) is the most common of all wheat diseases in the Texas Panhandle and the entire western portion of the Great Plains wheat production area. In this region, wheat is frequently irrigated and grown as a dual purpose crop for grazing and grain production. The absence of good genetic resistance to WSMV limits a producer's ability to maximize grain and forage production. Furthermore, the disease has an extremely negative impact on crop water-use efficiency and restricts a producer's ability to make intelligent decisions concerning irrigation scheduling. Research on the impact of WSMV on plant development, forage yield, and water-use efficiency are topics not currently being investigated.

OBJECTIVES

- 1) Develop regionally adapted wheat cultivars with durable resistance to WSMV and greenbug.
- 2) Evaluate the effect of WSMV on crop water use efficiency in wheat.
- 3) Develop irrigation scheduling recommendations for wheat infected by WSMV

RESULTS / BENEFITS

- Germplasm with strong genetic resistance to WSMV and greenbug will be developed.
- Profitability for wheat producers in the Texas Panhandle and throughout the western Great Plains will potentially be increased by applying specific irrigation management recommendations to wheat crops infected by WSMV.
- These new irrigation protocols will allow producers to save money and conserve groundwater by eliminating unnecessary irrigation of diseased crops that are unable to efficiently use the water.
- Such savings could be substantial and by eliminating a single unnecessary 2 inch irrigation on a half-mile center pivot (528 ac), a producer could save more than \$8,000 and 28.6 million gallons of groundwater.



Center Pivot Research Facility at Bushland, TX



Wheat Streak Mosaic Virus in Wheat