

Feasibility of Water Management Strategies for the Declining Ogallala Aquifer in the Northern Texas High Plains During the Next 60 Years

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BACKGROUND

The Region A groundwater aquifer level in the heavily irrigated, northern region of Texas continues to decline with this portion of the Ogallala Aquifer having no appreciable rate of recharge. The new state water planning requirements warranted a feasibility analysis of water management strategies that could be potentially implemented during the next 60 years to reduce the rate of aquifer pumpage for irrigation use. The strategies proposed in Senate Bill 1 were those of ET network scheduling, changes in crop variety, irrigation equipment improvements, changes in crop type, implementation of conservation tillage methods, precipitation enhancement, and the conversion from irrigated to dryland farming.

OBJECTIVE

- 1) Determine which, if any, of the water conservation strategies would save any water within Region A and what the cost to the regional economy would be if the strategies were implemented.

RESULTS

Analysis of the respective strategies above indicate that while water is conserved, implementing some of the strategies are devastating to the Region A economy. Assuming water savings is the principle objective in the decision for implementation, the strategies of changing crop variety and the use of conservation tillage should be dropped from consideration. The two strategies of changing crop type and conversion of irrigated to dryland production generated the largest water savings, but they would impact the regional economy in a significantly negative manner. The strategies of precipitation enhancement and irrigation scheduling provided both a substantial water savings would and have a positive impact on the regional economy. The results indicate that full implementation of these strategies should be implemented as benefits outweigh costs. It should be recognized, however, that implementation of only the cost effective strategies do not meet the extent of the water savings required during the 60-year horizon to balance the groundwater supply versus projected irrigation and livestock demands. Water researchers associated with this project continue to evaluate in SB2 potentially new conservation measures and impacting factors, such as high natural gas prices and new regulatory rules potentially imposed by area groundwater districts. In all likelihood, a combination of the above will be required to maintain a viable agricultural economy for Region A during the next 60 years.

