Reprinted from the 1979 Annual Wheat Newsletter 26:84-85. June, 1980.

SPRING WHEAT GROWN WITH MUNICIPAL WASTEWATER[1]

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Representative fields of wheat were carefully identified on similar soil types and under similar management practices for detailed studies in 1974 and 1975. The principal soil type was a Gilman loam. The Gilman series is a member of the coarse-loamy, mixed, (calcareous), hyperthermic family of Typic Torrifluvents. The response of wheat to two irrigation treatments: (1) pump water alone and (2) a 25/75 mixture of pump water and wastewater were compared by sampling the selected fields each year. A randomized complete block experimental design with four replications was used to compare the response of wheat to the two irrigation treatments. The cultivars evaluated were 'Siete Cerros' in 1974 and 'Cajeme 71' in 1975. In both 1974 and 1975, the wheat that was irrigated with pump water received 112 kg/ha of N prior to planting; however, the wheat that was irrigated with pump water and wastewater was not fertilized with commercial fertilizer. Approximately 82 cm (32 inches) of irrigation water were required to grow wheat to maturity, assuming 60% irrigation efficiency. All other cultural practices were similar for wheat grown under the two irrigation treatments.

In 1974, wheat irrigated with a mixture of pump water plus wastewater produced taller plants than did wheat grown with pump water alone; however, in 1975 wheat irrigated with the two types of water produced plants of similar height. The 2-year average indicated that wheat grown with pump water plus wastewater produced taller plants than did wheat produced with only pump water. Wheat irrigated with a mixture of pump water and wastewater produced more heads per unit area, heavier seeds, higher grain yields, and higher straw yields than did wheat grown with only pump water. Irrigation treatment had no significant effect on the number of seeds per head.

The plant height and straw yield data clearly indicated that wheat grown with a mixture of pump water plus wastewater produced more vegetative growth than did wheat produced with pump water. The increased vegetative growth from wheat grown with pump water plus wastewater was believed to be responsible for the increased lodging observed in that irrigation treatment. Although wheat grown with the pump water and wastewater mixture produced significantly higher

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[1]Contribution from the Department of Plant Sciences; Department of Soils, Water, and Engineering; and Water Resources Research Center; University of Arizona; Tucson, Arizona 85721. The research reported in this paper was supported by funds provided by the United States Department of Interior, Office of Water Research and Technology as authorized under the Water Resources Act of 1964 and by the State of Arizona.

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grain yields than did wheat grown with only pump water, the lower grain volume-weight of wheat produced with that irrigation treatment indicated that wastewater may lower the quality of wheat grain at the market place below the quality of wheat grain produced with pump water alone. Since wheat irrigated with the pump water plus wastewater mixture produced more straw than did wheat irrigated with pump water, a grower may expect to obtain higher yields of pasture forage, green chopped feed, and hay for livestock feed from wheat when wastewater is used as a portion of the irrigation water than may be obtained when only pump water is used for irrigation.