

# EFFECT OF SEEDING RATE ON ANNUAL WARM SEASON FORAGE YIELD AND PLANT STRUCTURE

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## ABSTRACT

Due to the decline of the Ogallala Aquifer and reduced irrigation capacity, there is growing interest in more water-efficient cropping systems in the semi-arid central Great Plains. To support the region's livestock industry, there is increased interest in forages because they use water more efficiently than grain crops. However, there is insufficient information on summer annual forage seeding rates in the range of environments encountered in the region. The objective of this study was to evaluate the effect of seeding rate on forage yield, nutrient value, plant height, stalk diameter, tillers and leaf- to- stem ratio for four types of summer annual forages: forage sorghum [*Sorghum bicolor* (L.) Moench], sudan grass [*Sorghum x drummondii*], pearl millet [*Pennisetum glaucum*], and sorghum [*Sorghum bicolor* (L.) Moench]-sudan [*Sorghum x drummondii*] hybrids. The study was conducted in 2022 at Garden City, KS, under irrigated and rainfed conditions, and in 2023 at Garden City (irrigated and rainfed conditions) and Hays, KS (rainfed conditions). The 2022 rainfed study was lost due to drought conditions. Six seeding rates were tested for each species (370,000, 740,000, 1,110,000, 1,480,000, 1,850,000, and 2,220,000 seeds/ha). Initial results showed significant differences between seeding rates for forage yield, plant height, stalk diameter, and tillers but not for leaf-to-stem ratio. Forage yield had a positive linear relationship with seeding rate but plateaued at different seeding rates depending on the species. These initial results indicate that a unique seeding rate recommendation for each species will be necessary to maximize yield-to-cost ratio under irrigation.