

Historically, wheat seeding rates ranged from 30-60 pounds per acre in western and central Kansas, but over the past 15-20 years farmers have gradually increased their seeding rates.

Have you ever wondered if there are any long-term wheat seeding rate studies to support the recommended seeding rates we currently use?

An eighteen-year wheat seeding rate study was established in 1985 at the KSU Agricultural Research Center near Hays, KS to address seeding rates combined with nitrogen rates. The site was a Harney silt loam in a wheat-sorghum-fallow rotation. In this study there were six seeding rates, 30, 60, 90, 120, 150, and 180 pounds per acre and two nitrogen rates, 0 and 40 pounds N per acre, so that each seeding rate was tested at the two N rates. Generally, planting occurred between September 25 and October 2 over the 18 years.

As one might expect, the 18-yr average for the 30 pounds per acre seeding rate combined with the 0 N rate had the lowest grain yield of all the treatment combinations (33.4 bushels per acre), followed by the 30 pounds per acre rate with the 40 pounds N per acre fertilizer rate (35.8 bushels per acre) and the 60 pounds per acre seeding rate with the 0 N rate (37.8 bushels per acre). The 60 pounds per acre seeding rate with 40 pounds N per acre yielded 41 bushels per acre and the higher seeding rates with 40 pounds N per acre treatments yielded from 41.5 to 41.9 bushels per acre.

Averaged over the two nitrogen rates, the 18-year yield average for the 30, 60, 90, 120, 150, and 180 pounds per acre seeding rates was 34.6, 39.4, 40.5, 40.2, 39.8, and 40.0 bushels per acre, respectively. Thus, there was a 4.8 bushels per acre yield increase or a 12 % yield increase as seeding rate increased from 30 to 60 pounds per acre, but only a 1.1 bushel per acre difference between the 60 and 90 pounds per acre seeding rate and no real yield differences as seeding rate increased. Averaged over the seeding rates, the 18-year average yield for the 0 N and 40 pounds N per acre fertilizer rates was 37.6 and 40.6 bushels per acre, respectively or a 7 % yield difference. It is interesting to note the grain yield for the 0 N rate was as high as it was and within 3 bushels of the 40 pounds N per acre rate. This indicates this Harney soil was making nitrogen available to the wheat crop through mineralization and/or there was some residual nitrogen available from the sorghum crop in the rotation.

What's the bottom line?

It appears that seeding rates between 60 and 90 pounds per acre are appropriate for central Kansas. There may be times when higher seeding rates may be necessary, especially with late plantings and after row crop harvest, but generally they will not increase yields. Also, the low seeding rate of 30 pounds per acre yielded within 12 % of the 60 pounds per acre seeding rate, which indicates if a wheat field has a thin, but uniform stand, yields could still be satisfactory. The three bushels per acre difference between the two nitrogen rates (0 and 40 pounds per acre) in this study indicates not so much the need for nitrogen fertilizer, which everyone recognizes is necessary, but rather the need to know how much residual nitrogen is in the soil so that economically appropriate nitrogen applications can be made.

For more details about this research see:

Kansas Fertilizer Research-2003. Report of Progress 921. P. 50-52. K-State Research and Extension.

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