

Tillage and Seeding Rate Effects on Wheat Cultivars I. Grain Production

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Research Summary

Tillage is declining in the Great Plains. Our objective was to determine if a tillage x cultivar interaction occurred for grain yield, protein concentration, kernel weight, and test weight for hard red spring wheat (*Triticum aestivum* L. emend. Thell) in a wheat-fallow monoculture. We also wanted to know if seeding rate x cultivar and tillage x seeding rate x cultivar interactions occurred for these grain traits. The cultivars AC Minto, Amidon, Bergen, Grandin, and Norm were seeded at 123, 247, and 371 live kernels m⁻² in conventional-till (CT), reduced-till (RT), and no-till (NT) systems in a randomized complete block with a split split-plot arrangement in southwestern North Dakota during 1995-1998. Tillage x cultivar, seeding rate x cultivar, and tillage x seeding rate x cultivar interactions did not occur for any grain trait. Yield was enhanced by as much as 482 kg ha⁻¹ under NT compared with CT and RT when relatively dry conditions occurred, but not when over-winter and growing-season precipitation exceeded the 30-yr average ($P < 0.05$). Kernel weight was as much as 2.8 g (1000 kernels)⁻¹ heavier under CT compared with NT in two of four years. Tillage did not affect grain protein concentration or test weight. A positive quadratic response in grain yield occurred as the seeding rate was increased, but other grain traits were not affected consistently by seeding rate adjustments. Results of this study suggest that cultivar recommendations under CT can be extended to RT and NT systems in a wheat-fallow monoculture.

This paper has been submitted for publication in a scientific journal and will be summarized in future press releases.

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