Impact of Tillage and Crop Rotation on Grain Yield of Spring Wheat I. Tillage Effect.

Patrick M. Carr[1], Richard D. Horsley2, and Glenn B. Martin[1]
North Dakota State University
[1]Dickinson Research Extension Center
[2]Department of Plant Sciences

Summary

Conservation tillage and crop diversification are increasing in the northern Great Plains. Few regional studies have determined if tillage influences crop rotation effects. Our objective was to determine if reductions in tillage affect grain yield of spring wheat (*Triticum aestivum* L. emend. Thell.) similarly in a rotation with field pea (*Pisum sativum* L.) and in a continuous spring wheat monoculture. Wheat grain yield under no-till averaged 40% higher compared with clean-till and 30% higher compared with reduced-till, regardless of cropping strategy (wheat-pea rotation and continuous wheat monoculture). An additional inch of stored soil water occurred under no-till compared with clean-till and probably explains much of the yield enhancement that resulted when tillage was eliminated. Better crop stand establishment under no-till also contributed to superior wheat grain yield in some years. Results of this research demonstrate that the beneficial effects of eliminating tillage on wheat grain yield apply across contrasting cropping strategies and support the continued replacement of clean-till with no-till systems in the northern Great Plains.

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