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Can novel management practice improves soil and environmental quality and sustains crop yield simultaneously?

Little is known about management practices that can simultaneously improve soil and environmental quality and sustain (GWP), greenhouse gas intensity (GHGI), and malt barley yield and quality were examined, from 2005 to 2011 in eastern Montana and western North Dakota. In both places, no-till barley-pea with N fertilization (NTB-P/N) increased soil organic C (SOC) and total N (STN) by 5-14%, but reduced residual soil NO3-N, GWP, and GHGI by 24-79% compared with the traditional practices (conventional till continuous barley or barley-fallow with N fertilization). Barley yield and quality were similar between the two practices. Novel management practices, such as NTB-P/N, can simultaneously enhance soil and environmental quality and sustain crop yield compared with traditional practices in the northern Great Plains.

Biography

Upendra M Sainju is a research Agronomist, USDA, ARS Northern Plains Agricultural Research Laboratory. He is currently working on the effects of tillage, crop rotation, crop diversity, cropping intensity, and cultural practices on soil aggregation, organic matter concentration, microbial activities, nitrogen mineralization, and carbon and nitrogen sequestration in dryland areas. He is also engaged in studying the effects of irrigation management, nitrogen fertilization rates, and cultural practices in nitrate-nitrogen movement in soil that affects water quality, soil organic matter level, and nitrogen mineralization in irrigated land.

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