Effects of thirty years of irrigation on the properties of semi-arid soils in Kansas. (S05-ricks144931-Oral)

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Abstract:

Irrigation began in western Kansas in the 1950's. The western third of the state is in the ustic moisture regime, receiving about 50 cm of precipitation per year. Irrigation adds an additional 50 cm of water per year and effectively alters the natural climate. Three soil series (Richfield, Keith, and Vona) were investigated to determine if irrigation has caused changes in soil properties. For each series, a long-term irrigated pedon (at least 30 years) and an adjacent pedon that had never been irrigated were sampled. There were no differences in the depth to free carbonates, but the irrigated pedons exhibited significantly higher total clay contents in the argillic horizon and more strongly expressed clay coatings. For example, the % clay of the Bt horizon for the irrigated and dryland Keith pedons was 25.9 and 23.2 respectively. The pH of the surface horizons of the irrigated Keith and Richfield pedons was 1.0 pH unit higher than the dryland pedons. Irrigation did not significantly affect organic C content or the calcium carbonate equivalent. These data indicate that 30 years of irrigation may increase clay illuviation and alter the surface horizon pH.

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