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WIND-ERODED NITROGEN BALANCE IN AN ENTIC HAPLUSTOLL UNDER DIFFERENT TILLAGE CONDITIONS

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Abstract

Little information is available on the combined effect of weather conditions and tillage systems on nitrogen lost from wind erosion. A field study was carried out on an Entic Haplustoll to analyze N content in the eroded material. Field measurements were made during the winter fallow (WF) and summer fallow (SF) periods in conventional (CT) and a no-till (NT) fields. Winters are more humid and less windy than summers. Results showed that there were N losses and gains by the wind with both tillage systems and in both seasons. Highest N gains in the crop cycle were 17.1 kg ha^{-1} and maximum losses 7.5 kg ha^{-1}. N gains were detected under high mass flow (the amount of wind-transported material entering the plots from external sources), vegetation cover and soil surface roughness conditions. When these variables were low, N was lost (or gains were low). Tillage system affected N transport more than season, through its effect on the soil surface cover (mainly with NT) or soil surface roughness (mainly with CT). Only when the mean wind speed was 2.3 times higher than the threshold wind speed was the effect of tillage on N transport by wind negligible under both NT and CT.

Key words: nitrogen balance, tillage system, wind erosion

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