

Abstract

To conserve soil fertility and prevent erosion, soil management regimes based on reduced tillage are highly suited to integrated production systems. Tillage effects on soil properties are usually site specific and depend upon the interaction of soil and climatic conditions, with soil and crop management practices. Field experiment were carried out in 2010-2012 at The Experimental Farm of the Agricultural University of Iasi, in the NE of Romania (47°07' N latitude, 27°30' E longitude), on a cambic chernozem (SRTS-2003, or haplic chernozems WRB-SR, 1998), with a clay-loamy texture, 6.8 pH, 2.7% humus content and a medium level of fertilization. Long-term amount of precipitation at this site is 517.8 mm at an average air temperature of 9.4°C. However, significant deviations from the long term average and temperature have been observed in recent years. The aim of this study is to evaluate the influence of tillage on soil structure and yield in the pedoclimatic conditions of the Moldavian Plain. The experimental soil tillage systems were as follows: V₁ – disc harrow, V₂ – paraplow, V₃ – chisel plow + rotary harrow, V₄ – plough at 20 cm and V₅ – plough at 30 cm (control variant). One of the main objectives for the soil tillage system was to create an optimal physicochemical state of the soil and to preserve this state over the whole vegetation period. Tillage systems significantly affected the maize yield. In Moldavian plain, in normally climatic conditions, the highest yield was recorded in the control treatment, plough at 30 cm and fertilized (9471 kg ha⁻¹), followed by conservation tillage – chisel (9054 kg ha⁻¹), but under water stress (2011-2012) we observed that the highest yields was at minimum tillage variants (chisel 3956 kg ha⁻¹, paraplow 3918 kg ha⁻¹).

Key words: conservative tillage, water stable aggregates, maize yield