Tillage effects on soil properties and rape crop production in the Moldavian plateau, Romania

Lucian RĂUS, Adriana BĂLAN, Gerard JITĂREANU - USAMV Iasi

The project aims the sustainable development in Romania, soil, water and carbon conservation, and counter-balances the effects of global climate change. Research carried out aimed at developing fundamental knowledge through in-depth inquiries of soil quality indicators of Moldavian Plain, regarding integrated management of soil and water. Research carried out also aimed to quantify the influence of agricultural technologies on physic, hydric, thermic, nutrient and biological soil regime, and ecological impact of these changes on ecological, energetically, hydrological, biogeochemical and breathing soil function, in specific areas of Moldavian Plain. The experiment was conducted at the Didactic Station of the „Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine of Iasi, Ezareni Farm, during farming years 2007-2009. The experimental site is located in the East part of Romania on a chambic chernozem, with a clay-loamy texture, 6.8 pH units, 3.7 % humus content and a medium level of fertilization. The soil has high clay content (38-43%) and is difficult to till when soil moisture is close to the wilting point (12.2%). We have investigated three variants of soil tillage system – conventional tillage, minimum tillage and no-till – in the crop rotation made of wheat and raps. This paper presents the results obtained in winter rape growing as concerns the influence of the tillage method on some soil physical characteristics. Tillage system modify, at least temporarily, some of the physical properties of soil, such as soil bulk density, penetration resistance, soil porosity and soil structural stability. All the tillage operation was significantly different in heir effects on soil properties. The results indicate that soil tillage systems must be adjusted to plant requirements for crop rotation and to the pedoclimatic conditions of the area.