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Cropping systems and fertilization effects on erosion and soil quality in Moldavian Plain

G. JITAREANU, C. AILINCAI, D. BUCUR, L. RAUS - USAMV Iasi
Despina AILINCAI - S.C.D.A. Podu Iloaiei

Investigations, set up in 1968, were carried out on a Cambic Chernozem with a slope of 14%. They have shown the influence of different crop rotations and fertilization on soil erosion and fertility. On slope lands from the Moldavian Plain, a good supply in mobile phosphorus for field crops (36-49 mg kg−1) was kept in case of the annual application of a rate of N100P80, and a very good supply in mobile phosphorus (71-78 mg kg −1) and mobile potassium (over 200 mg kg−1) was found at a rate of N80P60+30 t ha−1 of organic manure, applied in 3 or 4 -year crop rotations with legumes and perennial grasses. The total carbon mass on Cambic Chernozem from the Moldavian Plain has registered significant increases at higher than N140P100 rates, at organo-mineral fertilization and in 4-year crop rotation + reserve field cultivated with perennial grasses and legumes. The mean yield increases in wheat, during 1998-2009, were between 23 and 27 %, due to crop rotation and between 58 and 104 %, due to applied fertilizer rates. The determination of water runoff, soil, humus and nutritive element losses by erosion in different crops was done by means of loss control plots, which are isolated from the rest of the area by metallic walls and have basins and devices for division; we took water and soil samples from plots, for determining the partial turbidity and for analyses of chemical elements. On 16% slope lands, the crop structure, which determined the diminution in mean soil losses by erosion until 2.3 t/ha/year included 20 % straw cereals (winter wheat), 20% annual legumes (pea), 20% row crops (maize) and 40 % perennial grasses and legumes.