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The Cannona Data Base: long-term field data for studies on soil management impact on runoff and erosion processes.

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Long-term data have been collected by IMAMOTER-CNR from field-scale vineyard plots within the Tenuta Cannona Vine and Wine Experimental Centre of Regione Piemonte, which is located in a valuable vine production area in north-western Italy. Since 2000, runoff and soil erosion monitoring has been carried out under natural rainfall conditions on three parallel field plots (75 m long and 16,5 m wide, slope gradient about 15%) that are conducted with different inter-rows soil management techniques (conventional tillage, reduced tillage, controlled grass cover). Experimental plots are part of a 16-hectars experimental vineyard, managed in according to conventional farming for wine production. Recurrent surveys have been carried out in the runoff plots to investigate spatial and temporal variability of the soil bulk density, soil moisture and penetration resistance. The primary intent of the program was to evaluate the effects of agricultural management practices and tractor traffic on the hydrologic, soil erosion and soil compaction processes in vineyard. The Cannona Data Base (CDB) represents a data collection which is unique in Italy, showing the response of soil to rainfall in terms of runoff and soil erosion over more than a decade. It includes data for more than 200 runoff events and over 70 soil loss events; moreover, periodic measurements for soil physical characteristics are included for the three plots. The CDB can now be accessed via a website supported by the CNR, that is addressed to water and land management researchers and professionals. The CDB is currently used to calibrate a model for runoff and soil erosion prediction in vineyard environment.
The CDB website includes a descriptive and informative section, which contains results of over than 10 years of experimental activity, reports and presentations, addressed to enhance the awareness of citizens and stakeholders about land degradation processes and about impacts of different soil management practices on water and soil conservation.
The monitoring activities at the Cannona Experimental Site are currently carried out and implemented in order to improve the understanding of the soil management effects on soil hydrology, erosion and compaction in sloping vineyards. Land use and soil management strongly influence the hydrologic processes in the soil. In Italy vines are widely cultivated on hills and mountain slopes, within areas which are frequently affected by landslides. Such natural events are strictly related to hydrologic behavior of the soil, that drives the runoff formation on slopes and the consequent sediment delivery to water courses. Data from the CDB could be used in a multidisciplinary approach to investigate interactions among land use/ soil management and natural processes at different scales.