Soil compaction can be handled either mechanically or biologically, using plant species with vigorous root systems. Besides this, both strategies can act differently on the soil water drainage. Thus, the objective of this study was to determine the effect of crop rotation of cover crop species in no-till and chiseling on soil water drainage. The experiment has been carried out since 2003 on a clayey Rhodic Nitosol, in Botucatu, state of São Paulo, Brazil, region characterized by a dry winter. The experimental design was a randomized complete block design, in a split-plot arrangement, with four replicates. Plots consisted of the fall-winter crops, triticale (X Triticosecale) and sunflower (Helianthus annuus), and subplots of the spring managements, pearl millet (Pennisetum glaucum), forage sorghum (Sorghum bicolor) and sultan hemp (Crotalaria juncea), besides chiseling in 2003 and 2009. Soybean (Glycine max) was grown in the summer. The volumetric water content was evaluated until 0.8 m, using a capacitance probe (Diviner 2000® - Sentek Pty Ltd., Stepney South Australia), during the winter-fall and spring season in 2012 and soybean season in 2012/2013, performing 105 assessments. The results of soil water drainage are still being calculated.