The chemical composition and quality of virgin olive oil are influenced by a variety of factors, among them geographical production area, climatic conditions, cultivar, and extraction process. The composition of fatty acids, and the levels of polyphenols, tocopherols, sterols and pigments change with maturation and depends on the cultivar, climate and growing conditions which are reflected in the quality grade, sensory characteristics, oxidative stability and nutritional value of the product. The objectives of this study were to evaluate the influence of harvesting date and cultivar on olive oil quality. The study was conducted during the harvesting seasons of 2011 in a olive orchard of cvs. Hojiblanca, Koroneiki and Barnea in Cholqui (33°,42',0''S;71°,13'0.12''O), Metropolitana region, Chile. At each harvest date, three olive tree replicates were harvested. Oil was extracted with monoblock extraction machine. Quality parameters, fatty acids profile, tocopherols and induction period were carried out following AOCS methods. Total phenols were determined by HPLC. All of oils were extra virgin quality. At first harvesting Hojiblanca olive oils had the highest value of phenols (835 mg tyrosol equivalents/kg oil. Barnea olive oils contained the highest values of alpha tocopherols. Hojiblanca showed an increase of oleic acid with the maturation. With the ripening, an increase of phenolic compounds and alpha tocopherol was observed in oils from Barnea and koroneiki varieties. Contrary, in Hojiblanca oils antioxidant compounds decreased, indicating an earliest maturation in this variety. The stability of the olive oils was proportional with the content of antioxidant compounds.