Effect of irrigation deficit on quality of olives and olive oil during fruit storage

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The effect of irrigation deficit on quality of olives (green and ripe) at harvest and during storage and on olive oil quality extracted during storage was evaluated. Mature ‘Konservolea’ olive trees received 5.8 m³/tree of irrigation water until late July and continued to be irrigated in August (pit hardening) with 3 m³/tree (control) or 0.32 m³/tree (deficit). Irrigation resumed to both treatments in September because of inadequate rainfall. Green fruit were harvested late September and their quality was measured immediately and after 1 and 2 weeks of cold storage at 5 ºC plus 1 day of shelf-life. Quality evaluations included skin color, flesh firmness, dry matter and total phenols. In early November ripe olives (from 50% to fully black olives) were harvested from the same trees and quality evaluations were assessed on fruit and olive oil at harvest and after 11, 17 and 24 days of storage at 5 ºC. Quality evaluations of ripe fruit at harvest included respiration rate, fruit size and shape, density, skin color and chlorophyll content, firmness, oil and water content. Respiration rate, skin color, firmness, and chlorophyll content were also evaluated during storage, while on olive oil extracted at each storage evaluation acidity, peroxide value, and spectrophotometric oxidation indexes were also evaluated. Green olive quality did not change significantly with storage except an observed reduction in total phenols. Water quantity did not affect green olive quality, while ripe fruit from deficit irrigated trees were slightly bigger (possibly due to variation in total fruit load per tree) and of more advanced maturity (based on skin color and firmness) with lower oil content than control fruit. Olive oil extracted from fruit irrigated in deficit conditions was not different from olive oil obtained by control fruit when extracted soon after harvest, but the differences increased during storage where olive oil from deficit irrigated fruits resulted in a lower quality.