Effects of reflective mulch on leaf physiology and fruit quality and storability in 'Konservolea' olives

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Abstract

Reflective mulch (Extenday®) was applied on the tree row to minimize weed growth and soil water evaporation and to increase light availability in the canopy of 'Konservolea' olive trees. The effects of the reflective mulch use on olive leaf physiology and olive fruit quality and storability were followed. Mulch was applied on the tree row mid July when pit hardening occurs. Leaves from new growth and one-year-old shoots were sampled every month from June to September and leaf chlorophyll and dry matter content were measured. Leaf photosynthesis and other physiological parameters were measured or calculated in late July, and in early and late August. Fruit growth was followed during July and August and green olives were harvested late September. Fruit quality included skin color, flesh firmness, % dry matter, phenol content and chilling injury evaluation. Fruit were also cold stored for up to 5 weeks and their quality was measured periodically. Leaves above the reflective mulch had a higher % dry matter late in the season and lower chlorophyll content after mulch application than leaves from control trees (herbicides used for weed control on the tree row). Photosynthetic rate and stomatal conductance were not affected by the presence of mulch, but leaf temperature increased, transpiration rate slightly decreased and leaf water use efficiency and quantum yield decreased due to reflective mulch compared to the control. Fruit growth was not affected over the summer period by mulching. Olives with reflective mulch remained greener and were harder during cold storage and had a higher % dry matter compared to control fruit at harvest and during the 5 weeks cold storage. Chilling injury was delayed from the reflective mulch application and, only after 5 weeks cold storage, the olives from the mulch treatment had significant chilling injury symptoms, but chilling injury was still lower than olives from the control trees.