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Irrigation effects on soil attributes and grapevine performance in a 'Godello' vineyard of NW Spain

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Irrigation systems are increasingly being used in Galician vineyards. However, a lack of information about irrigation management can cause a bad use of these systems and, consequently, reductions in berry quality and loss of water resources. In this context, experiences with Galician cultivars may provide useful information. A field experiment was carried out over two seasons (2012-2013) on Vitis vinifera (L.) cv. 'Godello' in order to assess the effects of irrigation on soil attributes, grapevine performance and berry composition. The field site was a commercial vineyard located in A Rúa (Ourense-NW Spain). Rain-fed vines (R) were compared with two irrigation systems: surface drip irrigation (DI) and subsurface drip irrigation (SDI). Physical and chemical characteristics of soil were analyzed after installing irrigation systems at the beginning of each season, in order to assess the effects that irrigation might have on soil attributes. Soil water content, leaf and stem water potentials and stomatal conductance were periodically measured over the two seasons. Yield components including number of clusters, yield per plant and cluster average weight were taken. Soluble solids, pH, total acidity and amino acids contents were measured on the grapes at harvest. Pruning weight was also recorded. Soil attributes did not significantly vary due to the irrigation treatments. Stem water potentials were significantly lower for R plants on certain dates through the season, whereas stomatal conductance was similar for the three treatments in 2013, while in 2012 SDI plants showed greater stomatal conductance values. SDI plants yielded more than those R due to both a greater number of clusters per plant and to heavier clusters. Pruning weight was significantly higher in SI plants. Berry composition was similar for the three treatments except for the amino acids content, which was higher under SDI conditions. These results may be helpful for a sustainable management of irrigation in Galician vineyards.