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Effect of Potassium and Iron on Berries Resveratrol and Viniferin Accumulation and Antioxidant Capacity of 'Bidaneh Sefid' Grapevine Cultivar

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Nutrition management in growth season has a main effect on production and accumulation of secondary metabolites in grapevine berries. In this research the effects of foliar application of potassium sulfate (K; 0, 1.5, and 3%) and iron chelate (Fe; 0, 0.5, and 1%) on accumulation of resveratrol and viniferin and antioxidant capacity of 'Bidaneh Sefid' grape berries was evaluated. This study was carried out as a factorial experiment based on completely randomized block design in commercial vineyard located in Malayer city during 2016-2017. The fruits were harvested based on maturity index. Some characteristics of berries such as flavonoids, total phenols, anthocyanin, vitamin C, resveratrol, viniferin, antioxidant capacity, catalase, guaiacol peroxidase, and ascorbate peroxidase were measured. Based on the results, the highest berry total anthocyanin and vitamin C was related to sprayed vines with 1% Fe- EDDHA and 1.5% potassium sulfate in solely respectively. The highest total phenol observed in vines sprayed with 1.5% potassium sulfate in combination with 1% Fe- EDDHA. However, the lowest total phenol content was found in control vines. The highest berries resveratrol and viniferin concentration was observed in vines sprayed with moderate doses of both fertilizers. Moreover, berry antioxidant capacity of vines treated with moderate doses of both fertilizers was found to be highest. Nutrient -treated vines with both fertilizers at third level showed the higher guaiacol peroxidase in compared to otherplants. The highest catalase activity of berries was related to vines treated with 3% potassium sulfate in combination with 0.5% Fe- EDDHA. However, the maximum ascorbate peroxidase was obtained with 1.5% potassium sulfate in combination with Fe-EDDHA at 0.5% concentrations. The lowest activity of all enzymes was obtained in control un-treated vines.

Keywords: Anti-oxidant enzymes, Fertilization, Grapevine, Secondary metabolites, Stilbenes.

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