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**Abstract**

Mexican lime growing in Hormozgan province is an awesome example of industrial horticultural crops production in Iran. However, over the last two decades, witch's broom disease of Lime (WBDL), caused by Candidatus Phytoplasma aurantifolia, has devastated Mexican lime orchards in south of Iran. The disease can result in shortened internodes and small leaves in the infected trees, then gradually leading to dry trees out within five to eight years. Furthermore, infected trees undergo significant changes in phenol compounds and enzymes related, protein pattern, and chlorophyll as well as carotenoid contents. Despite about 30 years of progress this disease, the necessity to combat WBDL is still of interest. In the current study, the role of zinc sulfate and Bordeaux mixture in controlling WBDL was assessed. The study was conducted in completely randomized design in autumn 2017 with three replications, so that each WBDLinfected tree was considered as an experimental replicate. WBDL-infected trees were foliar sprayed with zinc sulfate and Bordeaux mixture. The morphological characteristics, chlorophyll and carotenoid content, total phenol content and protein content were analyzed before and 40 days after treatments. Our obtained data indicated that zinc sulfate treatment can positively change morphological parameters including length leaf (125.2 ± 35.5 %), width leaf (158.3 ± 32.1%) and internode length (231.1 ± 48.8%), while application of Bordeaux mixture showed increasing influence on chlorophyll a, b and total chlorophyll content in WBDL-infected trees. The total phenol content remained almost steady in zinc sulfate treatment (3.7 ± 1.01 %) in comparison to Bordeaux mixture (-64.7 ± 11.06 %). In addition, Bordeaux mixture and zinc sulfate enjoyed significant influence on PI, about 65 % and 50 % respectively. Their effectiveness on Fv/Fm were 7.7 % in Bordeaux mixture and 5.2 % in zinc sulfate.