Title:
3055-Deciphering the Effect of Vitamins and Mineral Nutrients on Kiwiberry Micropropagation using computer-based tools

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Abstract body text:
Mineral nutrients are essential components of basal media for optimal growth and development of plants grown in vitro, and their deficiency causes physiological disorders. Vitamins have several physiological functions, however their role in the growth and development of micropropagated plants remains scarce and controversial. The objective of this work has been to shed light on the role of mineral nutrients and vitamins as main components of the in vitro basal medium on the quality of micropropagated kiwiberry (hardy kiwi). Two computer tools were used: design of experiments (DOE) and machine learning (ML), particularly neurofuzzy logic (NL). Two different experiments were designed using a well-sampled five-dimensional experimental design space of 33 treatments using DOE. In both experiments five independent factors were established, in the first the following mineral salts: NH4NO3, KNO3, Mesos, Micros and Iron, while in the second, the following five vitamins: myoinositol, thiamine, nicotinic acid, pyridoxine and vitamin E. Neurofuzzy logic models were used to identify the critical vitamins and mineral nutrients on shoot length (SL) and shoot quality (SQ). Neurofuzzy logic models showed that only 8 mineral elements out of 18 studied were critical factors affecting both parameters studied, while only three vitamins out of five were relevant. In conclusion, these results shed light on the effect of mineral nutrients as key requirements on shoot growth and quality and, for the first time, identified the relevant role of vitamin E on shoot growth of micropropagated kiwiberry.