عنوان مقاله:

Non-Destructive Measurement of Leaf Area in Olive Trees Using the Group Method of Data Handling

محل انتشار:

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خلاصه مقاله:

Computer skills and mathematical modeling have recently advanced quickly. Their development has gone without a hitch. The developments have accelerated our scientific analyses. Therefore, it is beneficial and necessary to seize these opportunities. One of the most significant characteristics of a tree is its leaf area, which is strongly correlated with its physiological and ecological variables such as growth, evapotranspiration, light interception, photosynthesis, and leaf area index. A sub-model of an artificial neural network is the group method of data handling (GMDH-type NN). Applications of such a self-organizing network are effective across a wide spectrum when used. However, the use of GMDH-type NN is still unusual in several fields, including horticultural science. Research on the individual leaf area of plants, both in horticulture and physiology, requires accurate and nondestructive techniques. Measuring the length (L) and width (W) of leaves is one way to calculate the individual leaf area (LA) of olives (Olea europaea). This study examined if an equation could be created to determine the leaf area of various olive genotypes using seventeen olive genotypes in an open-field situation in ۲۰۱۷. In this case, a new approach for designing the whole architecture of the GMDH-type NN uses a genetic algorithm. The purpose of this work was to determine if leaf area (output) could be estimated using GMDH-type NN given certain variables, such as leaf width and length. The findings demonstrate that GMDH-type NN is a useful tool for quickly and accurately identifying patterns in data, producing a performance index based on input investigation, and predicting leaf area depending on leaf width and length.

کلمات کلیدی:

GMDH-type NN, Modeling, Neural Network, Olea europaea