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The effectiveness of using an amino acid biostimulant in strawberry cultivation at different soil moisture levels

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Abstract

Abiotic stress has a significant influence on plants at all stages of their development. One of the abiotic stress factors is soil water deficit, which reduces plant growth and productivity. Crop productivity during drought can be improved by biostimulants, i.e. preparations enhancing the natural immune mechanisms of plants. An experiment was conducted in western Poland to examine the effect of a biostimulant containing amino acids on the biological properties of soil, measured by its enzymatic (dehydrogenase, protease) and respiratory activity, vegetative growth, and fruit quality of strawberries growing on low, optimal, and high moisture soil. The experiment showed that the soil moisture level significantly affected the parameters under study. The dehydrogenase, protease and respiratory activities in the water-deficient soil were from 27 to 47% lower than in optimal moisture soil. The average leaf weight and the content of chlorophyll a and b were also significantly lower. The plants growing in the water-deficient soil also yielded fruit with the lowest weight. In the variants where the leaves of strawberry plants had been sprayed with the biostimulant, the soil enzyme and respiratory activities as well as the average leaf weight were several dozen per cent greater than in the variants without this treatment. The content of chlorophyll a and b in the leaves, the average fruit weight, and the content of soluble substances in the strawberries also increased significantly. The biostimulant was most effective in the water-deficient soil.

Keywords: strawberry, drought stress, amino acids biostimulant, enzyme and respiratory activities, fruit quality