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Among the multiple factors that determine the onset and course of vegetative growth and the morphogenesis of floral buds in the crown of fruit trees, phytohormones -substances with either stimulating or inhibitory effects -play an important role. Biologically active substances (BAS) of natural origin contribute to increasing the productivity and useful resistance of plants. The purpose of this study is to evaluate the influence of treatments with BAS Reglalg treatments on several biological characteristics, including leaf surface area, photosynthetic pigment content, and net photosynthesis in plum trees.The study subjects were the leaves of two late-ripening plum varieties of foreign origin: Stanley, selected in the USA and Prezident in the UK, as well as two local varieties: Udlinionnaia and Superprezident. During the vegetation period, the trees were treated with a mixture of BAS Reglalg and microelements (B, Zn, Mn, Mo). It is established that climatic conditions have a considerable influence on plant growth and productivity. In June-July 2023, the average daytime temperature was slightly higher and theamount of precipitation lower than normal, which caused a decrease in the leaf area of the leaves and, respectively, of the biomass accumulation during the vegetation period.It was founded that the leaf index varied from 2.6-4.5 m2in the control and to 7.0-5.1 m2in the treated ones in depends of varieties. The local varieties Udlinionnaia and Superprezident were highlighted by higher values. One of the main indices characterizing the influence of external conditions on the growth and development of plants is the content of photosynthetic pigments in the leaves. It was established that the dynamics of the photosynthetic pigments accumulation regardless of the variety and variant was similar. So, the differences in the average chlorophyll content in the leaves of treated and control plum trees were 7 -15% and in the content of carotenoids 1 -5%. During June-July, the concentration of pigments in the leaves decreases; however, in plants treated with Reglalg in combination with microelements, this diminution is less pronounced than in the control, due to theprotective effect of the treatment. The autochthone varieties Udlinionnaia and Superprezident exhibited superior indices than foreign varieties by 30 -50%. Local varieties were distinguished by a higher net photosynthetic productivity in variants with Reglalg in combination with microelements by 11 % for cv. Udlinionnaia and 8 % for cv. Superprezident, while plum plants of cv. Stanley and Prezident, this value was higher by 3 -4%.Therefore, the analysis of the obtained results argues the considerable influence of the BAS Reglagl in complex with microelements B, Zn, Mn, and Mo on the metabolic processes that characterize the activity of the production system in plum plants.