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THE IMPACT OF GROWING CONDITIONS ON THE PRODUCTIVITY OF PLUM AND APPLE TREES, DEPENDING ON GENOTYPE

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Insufficient soil moisture and long periods of atmospheric drought during the growing season have a negative impact on the growth and development processes of fruit plants and, consequently, on the harvest of various fruit crops. Plum and apple are among the main fruit crops in the Republic of Moldova. A feature of plum is its resistance to adverse environmental factors. At the same time, in conditions of soil moisture deficiency, the adaptability of the crop in general, and of the varieties in particular, decreases. Apple tolerates water stress better than other fruit crops due to its deeper root system. However, some varieties have a shallow root system, in which case they are more demanding on moisture than other varieties. Based on the above, the aim was to evaluate the productivity of plum and apple trees under conditions of soil moisture deficit, which would allow the subsequent development of various procedures for strengthening the production system of fruit trees in the current context of climate change.

The objects of research were trees of two late plum varieties: Stanley (of foreign selection) and Udlinionnaia (autochthonous), as well as two winter apple varieties: Golden Spur and Granny Smith, grown in lysimeters (vegetable houses) of the Institute of Genetics, Physiology and Plant Protection of the Moldova State University. The research was carried out applying the following scheme: a) control variant - plants grown under irrigated conditions (soil moisture – 70% of the field water capacity of the soil); b) experimental variant - plants grown under non-irrigated conditions. The average fruit yield per tree was determined by weighing.

As a result of the research conducted, it was found that the growing conditions during the vegetation period significantly influence the productivity of trees and the quality of fruits. With reference to the average fruit harvest per tree, we mention that

the Stanley variety from the variant with plants grown under non-irrigated conditions recorded a decrease in yield by 58.13%, compared to the control variant. This law also applies to the Udlinionnaia variety, as well as apple varieties. Thus, in the case of the Udlinionnaia variety of local selection, a decrease in yield was found by 35.83%, which represents a decrease of 22.30% compared to the Stanley variety of foreign origin. The Granny Smith apple variety grown under non-irrigated conditions recorded a decrease in yield by 22.65%, compared to the control variant, respectively, for the Golden Spur variety – by 52.78%.

Based on the results obtained, we can conclude that apple and plum trees grown under non-irrigated conditions were distinguished by lower productivity, compared to trees grown under irrigated conditions. Research into the physiological peculiarities of plant growth and development under adverse conditions is an important moment in understanding the mechanisms of plant resistance to low temperatures, drought and other stress factors. This fact could serve as a basis for developing procedures for targeted formation of the functional state and optimization of the production process in fruit plants.

Keywords: apple fruit, plum fruit, productivity, fruit quality, growing conditions.

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