

Effect of Nourishment Frequency on Soybean Yield and Biochemical Parameters Under Hydroponic Conditions

Anna Tadevosyan^{1*}, Anahit Tovmasyan¹, Armenuhi Asatryan¹, Artur Matevosyan¹,
Sergey Efimenko², Svetlana Efimenko², Stepan Mairapetyan¹

¹ Laboratory of Plant Nourishment and Productivity, G.S. Davtyan Institute of Hydroponics Problems, National Academy of Sciences, Yerevan, Armenia

² Laboratory of Biochemistry, Department of Biological Research, V.S. Pustovoit All-Russian Research Institute of Oil Crops, Krasnodar, RF

ABSTRACT

The yield and biochemical composition of plants can be affected by several factors of the external environment, such as the frequency of nutrient solution supply when growing plants hydroponically. The purpose of this study is to identify quantitative and qualitative changes in the productivity (yield and biochemical parameters) of soybeans depending on the frequency of nutrient solution supply under hydroponic conditions. Soybean yield varied significantly depending on the frequency of nourishment. In hydroponics, the maximum yield was obtained when plants were fed twice a day, which exceeded other hydroponic options by 1.2-1.8 times. When the frequency of feeding was reduced by half, the grain yield decreased by 20%, and with a fourfold decrease, by 80%. At the same time, all hydroponic options exceeded soil plants in yield by 1.1-2.0 times. Plants fed with the maximum frequency exceeded the others in 1000-grain weight by 10-30%. No significant differences in terms of fat accumulation were recorded depending on the growing technology. The frequency of feeding did not have a significant effect on the biosynthesis of protein and sugar in hydroponic soybeans, but the fiber content in the least fed and soil-grown plants increased by about 1.3-1.4 times. Soil plants, compared to hydroponics ones, had the lowest protein content (1.4-1.5 times) and the highest carbohydrate content (1.6-2.1 times). It can be concluded that for high soybean yield, plants need to be nourished twice a day in hydroponics. The frequency of nourishment in hydroponics does not affect the fat and protein content of soybean grains.

Keywords: soilless culture, glycine max, protein, fat, fibre, fatty acids

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*Corresponding Author:

Anna Tadevosyan, Laboratory of Plant Nourishment and Productivity, G.S. Davtyan Institute of Hydroponics Problems, National Academy of Sciences, Noragyugh 108, Yerevan, 0082, Armenia.

Email: anntadevosyan.hydropon@gmail.com