

SOYBEAN PRODUCTIVITY DEPENDING ON ELEMENTS OF GROWING TECHNOLOGY IN THE RIGHT-BANK FOREST-STEPPE OF UKRAINE

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Among a large number of agricultural crops, soybean is one of the most important high-protein and oilseeds of world agriculture, due to which its sown area in the world continues to grow. Increasing of soybean production in Ukraine is primarily aimed at solving the problem of vegetable protein and export potential of protein resources formation.

Thanks to the achievements of breeders, high-tech, highly productive and disease-resistant soybean varieties have appeared. However, the level of realization potential of their productivity is largely determined by the soil and climatic conditions of a particular growing zone and adapted growing technology, what is especially true for the latest climate change trends.

Significant factors of high seed yield formation of soybean is a variety and disclosure of its productivity potential due to seeds inoculation and the level of mineral nutrition of the plant. Moreover, the most debatable question remains feasibility of using nitrogen fertilizers, since some authors believe that due to nitrogen fixation, which takes place in nodules formed in symbiosis with rhizobia, soybean can significantly or even completely satisfy its need in nitrogen, other scientists believe that formation of high yields of soybeans is possible only with rational combination of biological and technical nitrogen to cover the needs of soy plants.

The purpose of research was to identify features of soybean productivity formation of different varieties depending on seeds inoculation and doses and timing of mineral fertilizers application in conditions of the Right-Bank Forest-Steppe.

Studies were performed during 2013-2015 in conditions of SERF "Salivonkivske" of the Institute of Bioenergetic Crops and Sugar Beet of NAAS on typical low humus mid loam chernozem. The humus content in 0-20 cm layer is 4.56%. The total contains of nitrogen in 0-20 cm layer 0.27-0.30%, phosphorus - 0.15-0.24%,

potassium - 2.2-2.4%. Fertilizing system included study of the following options: without fertilizers (control); $P_{60}K_{60}$; $N_{15}P_{60}K_{60}$; $N_{30}P_{60}K_{60}$; $N_{45}P_{60}K_{60}$; $P_{60}K_{60} + N_{15}$; $N_{15}P_{60}K_{60} + N_{15}$; $N_{30}P_{60}K_{60} + N_{15}$. Phosphoric and potassium fertilizers were applied under the main tillage, nitrogen fertilizers were introduced at spring under cultivation before sowing and in extra-feeding during the budding phase of soybean plants. In the experiments, we studied early-ripening variety Vilshanka and mid-ripening variety Suzir'ya (originator - NSC "Institute of Agriculture of NAAS ").

Agrotechnic in the experiment is generally accepted for conditions of the Right-Bank Forest-Steppe of Ukraine, with exception of studied factors. Soybean was sown at a soil temperature at 10 cm to 10-12 ° C with sowing rate 700 thousand seeds per 1 ha. Sowing was performed by untreated seeds and seeds, inoculated by phosphonitragin in the day of sowing. Predecessor is winter wheat.

Weather conditions in the years of research were significantly different. In particular, 2013 and 2014 were characterized as favourable for plant growth and development. In these years, hydrothermal coefficient (SCC), depending on the research option, was 1.2-1.5 and 1.4-1.5, respectively, the average daily temperature was 19.1-19.8 °C and 18.6 - 19.5 °C, the sum of active temperatures ($> 10^{\circ}\text{C}$) - 2019.5-2258.7 °C and 2003.7-2216.7 °C. In 2015, high average daily temperatures against background of low relative humidity and insufficient rainfall and their uneven distribution during the growing season limited realization of productivity potential soybean plants. In the indicated year, the SCC during growing season of the culture was 0.6-0.7, the average daily temperature was 21.1-21.6 °C, the sum of active temperatures ($> 10^{\circ}\text{C}$) - 2040.5-2324.4 °C, depending from the investigated option.

According to the results of research, was established that in conditions of the Right-Bank Forest-Steppe of Ukraine the maximum yields studied hybrids formed under condition of combination seed treatment before sowing by phosphonitragin and application of $N_{30}P_{60}K_{60}$ like the main fertilizer and extra feeding N_{15} in the budding phase, what allowed to obtain at early-ripening variety Vilshanka 2.91 t/ha and at mid-season variety Suzir'ya - 3.17 t/ha. Compared with the absolute control, the yield increase in these variants by 1.02 and 0.98 t/ha, respectively

