

## ABSTRACT

In recent years, in Poland, there has been an increase in interest in the production of soybean for seeds, however the optimization of agrotechnics is still an important element, as it has a decisive impact on the economic success of cultivation. In practice field, the reasons for obtaining unsatisfactory yields of soybean seeds are, among others, their inadequate positions in crop rotation, incorrect sowing and harvesting dates, failure to use seed inoculation with symbiotic cultures of bacteria, untimely weed control, unsuitably selected field architecture or lack of knowledge about the accurate variety farming selection in regard to the climatic and soil conditions of the place of cultivation.

In 2015-2017, in the proving grounds of the Department of Detailed Plant Cultivation (currently the Institute of Agroecology and Plant Production) of Wrocław University of Environmental and Life Sciences, two independent series of field studies were carried out on the influence of selected agrotechnical factors on the development and yield of soybean. The first (I) series of tests included the assessment of the impact of the varied spacing of rows and the number of sown seeds per unit area on the shaping of the canopy architecture, and as a result, the size and quality of the soybean seed yield. In the second (II) series of tests, the influence of the different row spacing and the application of Asahi SL on the development and yielding of soybean was analyzed. In both series of tests, the "split-plot" method was used, four repetitions, with two variable factors.

The length of the growing seasons of soybean was influenced by the variable thermal and humidity conditions in individual years of the research, but it did not depend directly on the analyzed research factors. The longest vegetation period in the three-year research period, 157 days, was recorded in the most variable weather conditions (including hailstorm) in 2017.

In the first (I) series of studies, the factor of differentiated row spacing (15, 30 cm) significantly determined: the number of fertile pods, the number and mass of seeds per plant, the mass of 1000 seeds and the percentage of seeds and stems in the structure of the above-ground part of the plant, which, however, was not further reflected in the level of the obtained yields of seeds and post-harvest residues and the yields of crude fat and total protein per hectare.

The factor of the different row spacing (15, 30 cm) in the second (II) series of tests significantly influenced: the height of the I pod, the number of branches I row, the number of seeds per plant, the mass of pods, stems and the whole plant, as well as the yield of post-harvest residues, without affecting simultaneously the harvested seed yield and nutrient efficiency.

The application of Asahi SL biostimulant had positive effects in comparison to the control object without the *biostimulant*, such as, the increase of plant height before harvest, number and mass of seeds from the plant, mass of the stems and the whole above-ground part of the plant, mass of 1000 seeds, causing an increase in the yield of seeds and post-harvest residues. as well as the efficiency of crude fat and total protein per hectare.

**Keywords:** soybean, row spacing, biostimulant, Asahi SL