

Summary of the doctoral dissertation

M.Sc. Bartosz Spsychalski

Evaluation of the response of winter oilseed rape to selected growth stimulators

The research was conducted in 2018–2020 in an individual farm on a production field located in Koszanowo [52°58' N 19°00' E]. The aim of the research conducted on the author's own farm was to evaluate the reaction of successively introduced winter rapeseed hybrid varieties to the Polish Register to a new biostimulation procedure using selected growth stimulators. For this purpose a one-factor canopy experiment was established on production fields sown with winter rape (*Brassica napus* L.). The tested factor was the application first in the form of soil application and then spraying of a complex of these growth stimulators. The biostimulation procedure adopted included: beneficial microorganisms, phototropic bacteria, humic and fulvic acids, plant amino acids, silicon, titanium and micronutrients. The growth and weight accumulation of the different organs in a single plant were analysed every year. The fresh and dry weight of the whole plant and individual organs were determined each time. The primary data obtained on the fresh weight of the whole plant and its individual organs made it possible to determine the indices of growth analysis of a single plant. The following were determined: the relative growth rate RGR of the whole plant and its individual organs, the unit leaf productivity ULR and the fraction of assimilating organs – leaves LWR. Moreover, the state of plant nutrition with nitrogen was evaluated using an indicator method, as well as the content of monosaccharides and the pH of cell sap. Seed yield was also determined at harvest. The applied biostimulation procedure resulted in a higher accumulation of fresh and dry mass of the plant and its individual organs, without significant changes in the course of this accumulation. The tested biostimulation procedure did not significantly change the value and time course of changes in the relative growth rate RGR of the whole plant and its individual organs, the unit leaf productivity ULR, or the fraction of assimilation organs – leaves LWR. Therefore, the applied biostimulation procedure did not change the pattern of fresh or dry mass distribution within the plant, which indicates that it is safe for the plants of winter rapeseed hybrid cultivars. The first part of biostimulators of this procedure applied to winter oilseed rape hybrid varieties in soil was more effective than the second part applied foliarly in the next 4 terms, but it was necessary at least to maintain the previously achieved effect of the procedure. The biostimulation procedure adopted in the present study improved the possibilities of further growth and development of winter rapeseed hybrid cultivars, which was evidenced by: an increase in the pH of cell sap towards neutral values, an increase in the content of nitrogen and sugars in this sap, further modified depending on the tier and BBCH stage of plant leaves. Moreover, the biostimulation procedure adopted in the study increased by 0.5 t ha⁻¹ the seed yield in hybrid winter oilseed rape cultivars.

Keywords: oilseeds, hybrid variety, growth analysis, cell sap quality, biostimulation procedure, seed yield