THE IMPACT OF FOLIAR APPLICATION OF BIOSTIMULATORS ON THE MORPHOLOGICAL CHARACTERISTICS OF THE LEAF ROSETTE OF WINTER RAPE PLANTS

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INTRODUCTION

The aim of the study was to evaluate the effect of biostimulators containing various active substances on the morphological features of the leaf rosette (number of rosette leaves, tap root length, height of the growth cone) and on the fresh and dry mass of the above-ground rosette and the root system of traditional and semi-dwarf winter oilseed rape morphotypes type of growth under changing climatic conditions.

MATERIAL AND METHODS

- The field experiment was caried out in three growing seasons (2013-2016) at the Agricultural Experimental Station - Zawady (52°03'N and 22°33'E) belonging to the University of Natural Sciences and Humanities in Siedlce, Poland.
- The experiment was set up in a split-plot configuration with three replications.

The examined factors were:

I - morphotypes of winter oilseed rape:

population (Poznaniak), hybrid restored with a semi-dwarf type of growth (PX104), hybrid restored with a traditional type of growth (Konkret),

II - four types of biostimulators:

1. control variant - without the use of biostimulators, sprayed with distilled water,

2. biostimulator Tytanit® (titan),

3.biostimulator Asahi®SL (sodium ortho-nitrophenol, sodium para-nitrophenol, sodium 5-nitroguaiacol),

4. biostimulator Silvit® (active silicon, potassium oxide, boron - form of pure element , zinc - form of pure element).

RESULTS

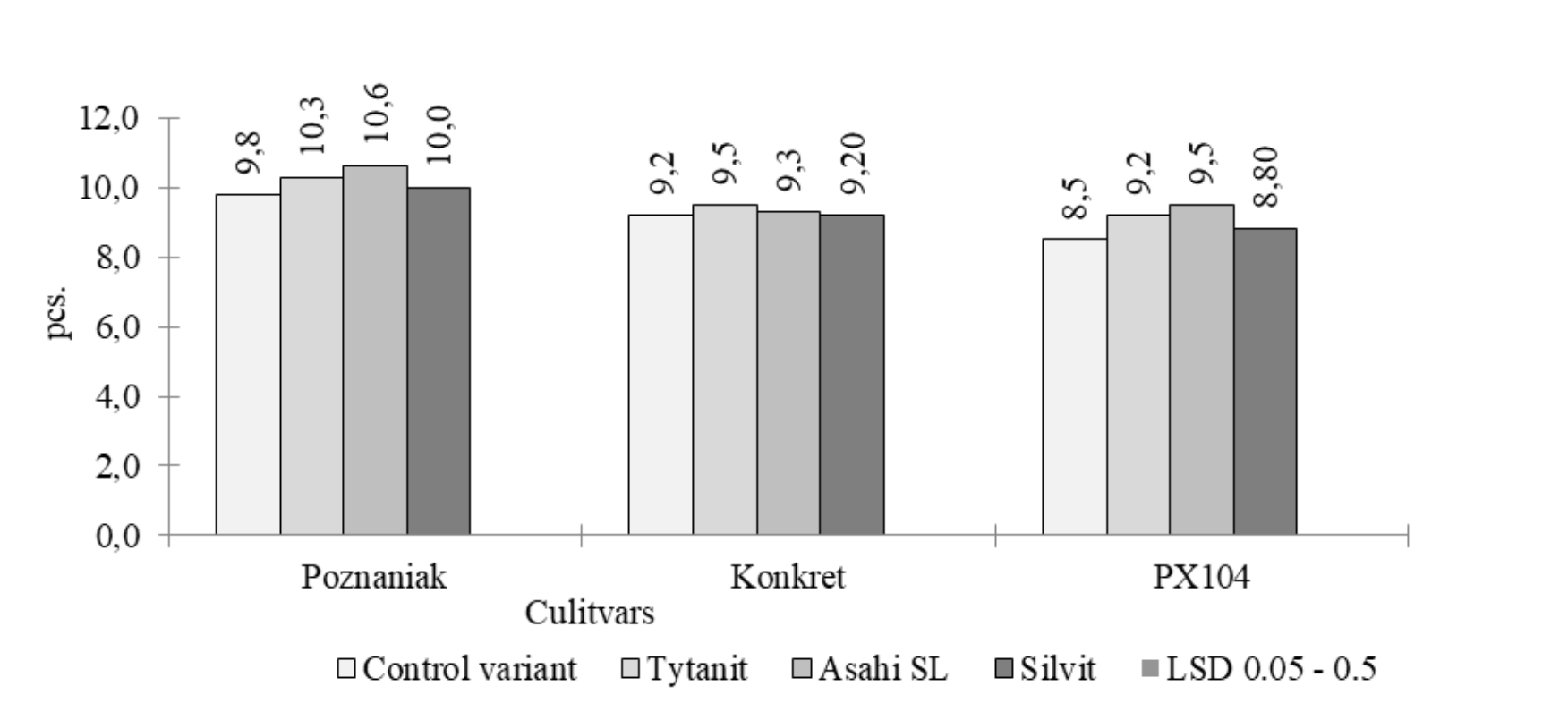

Figure 1. Number of leaves per rosette manufactured (pcs.) during autumn vegetation (interaction of varieties and types of biostimulants used)

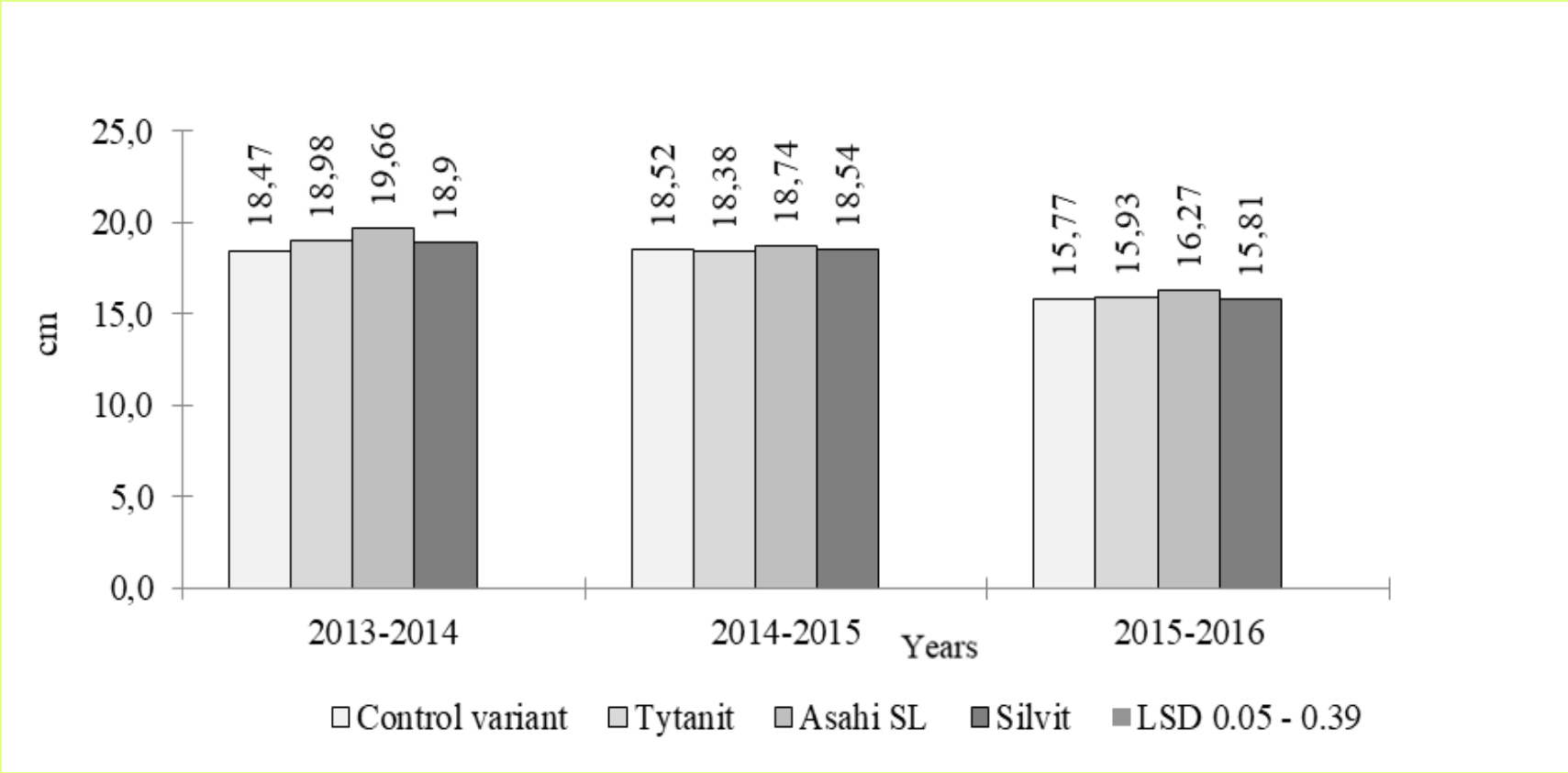

Figure 2. Pile root length (cm)
(interaction of years of research and types of biostimulants used)

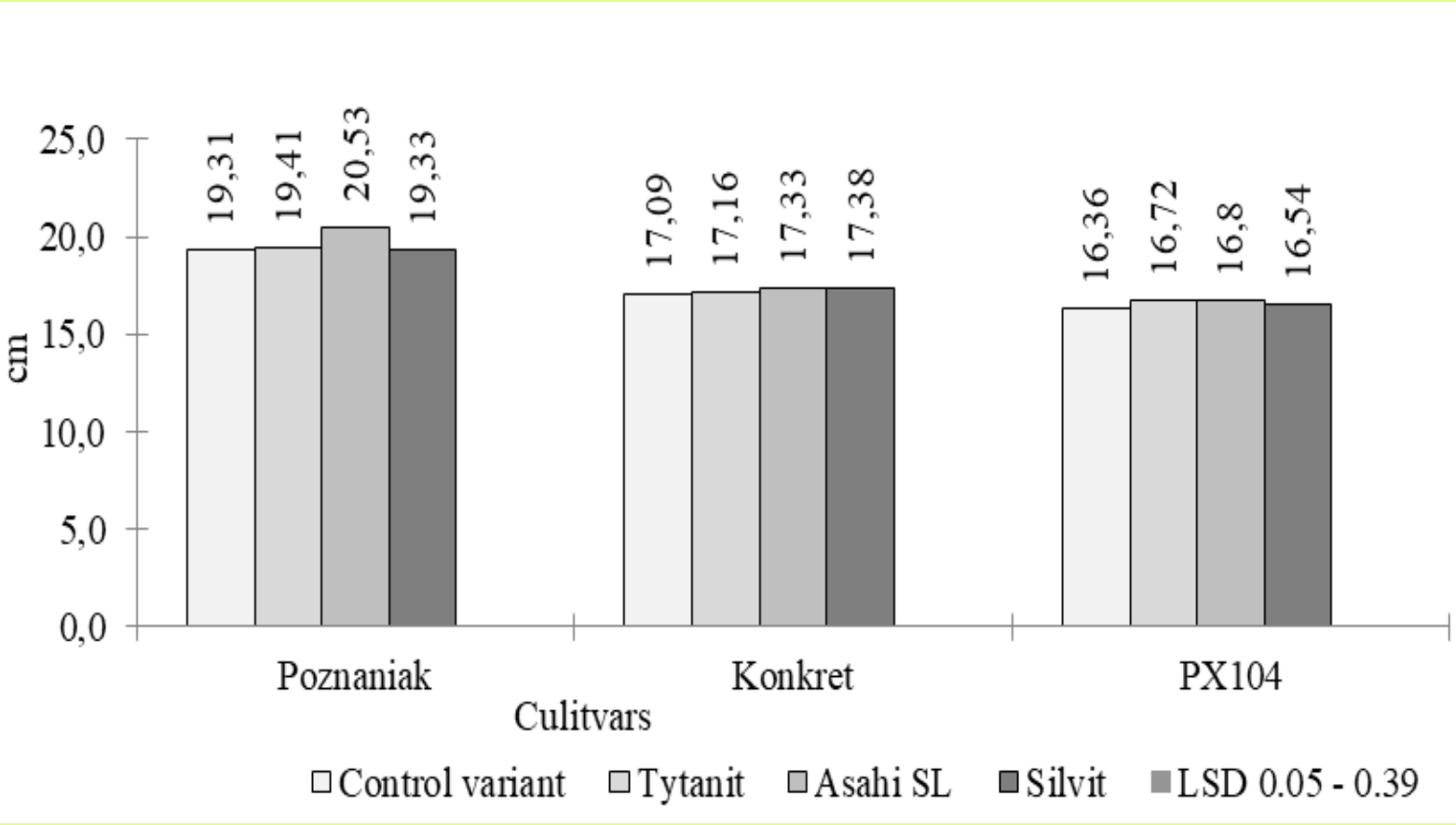

Figure 3. Pile root length (cm) (interaction of cultivars and types of biostimulants used)

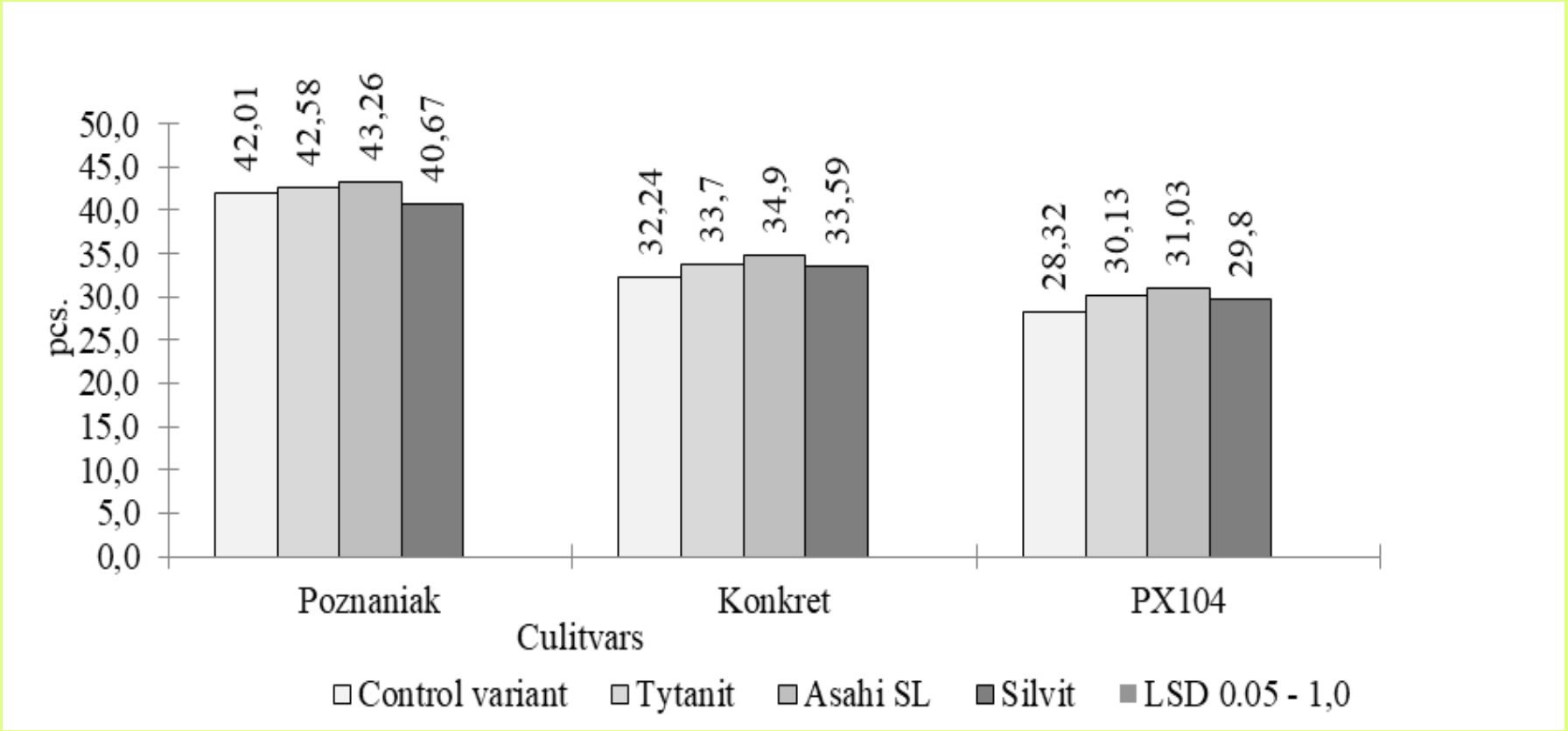

Figure 4. Green matter of one plant (g) (interaction of years of research and types of biostimulants used)

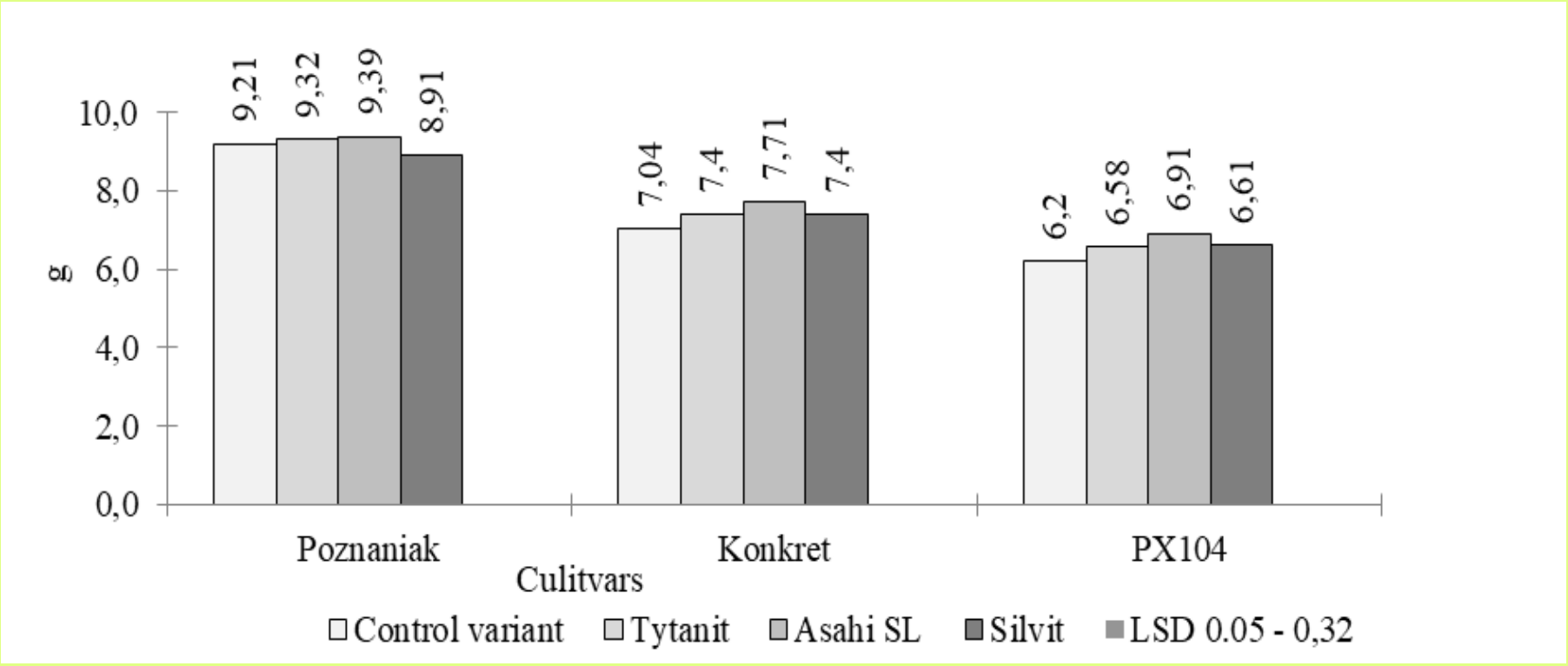

Figure 5. Dry matter of one plant (g) (interaction of cultivars and types of biostimulants used)

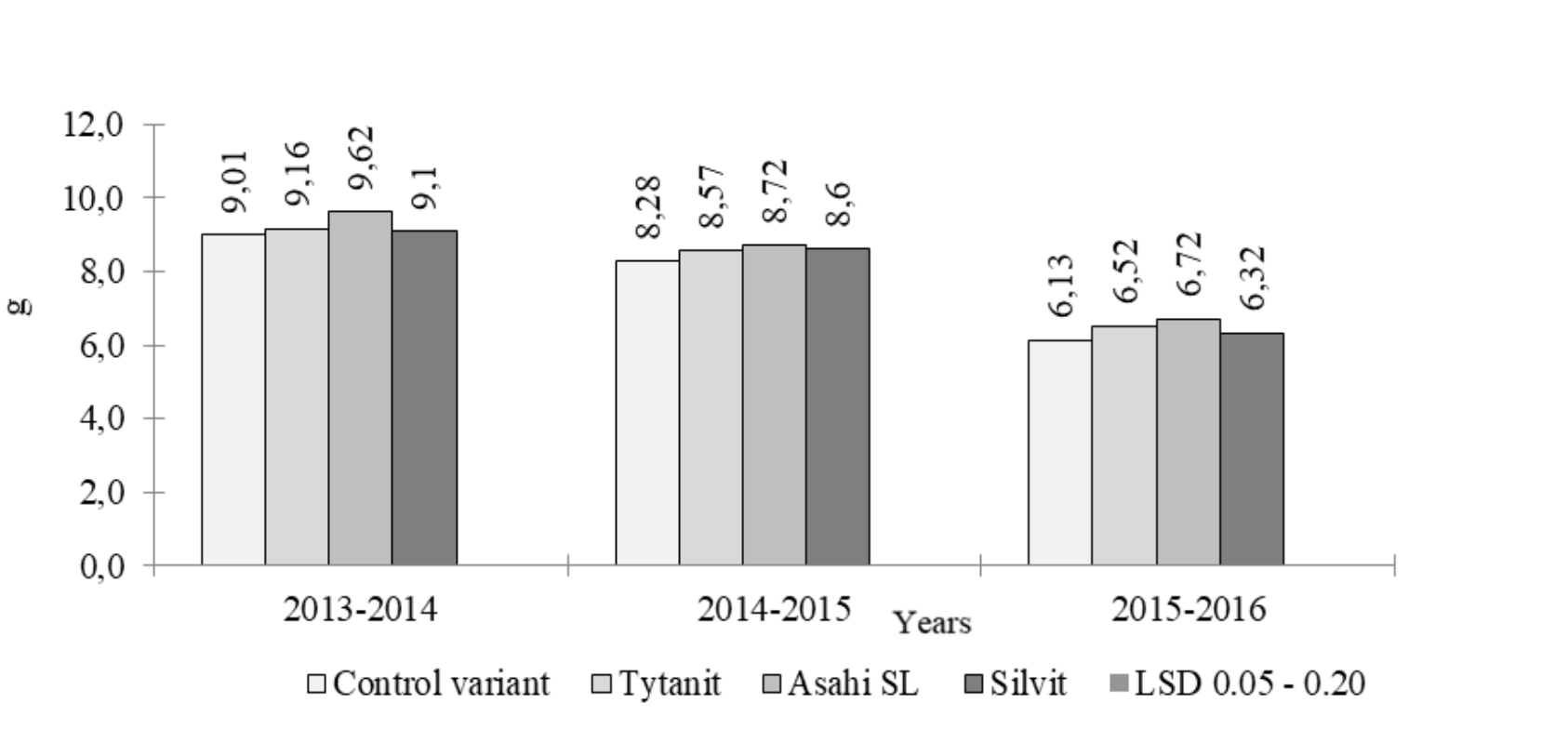

Figure 6. Green matter of the root system of one plant (g) (interaction of years of research and types of biostimulants used)

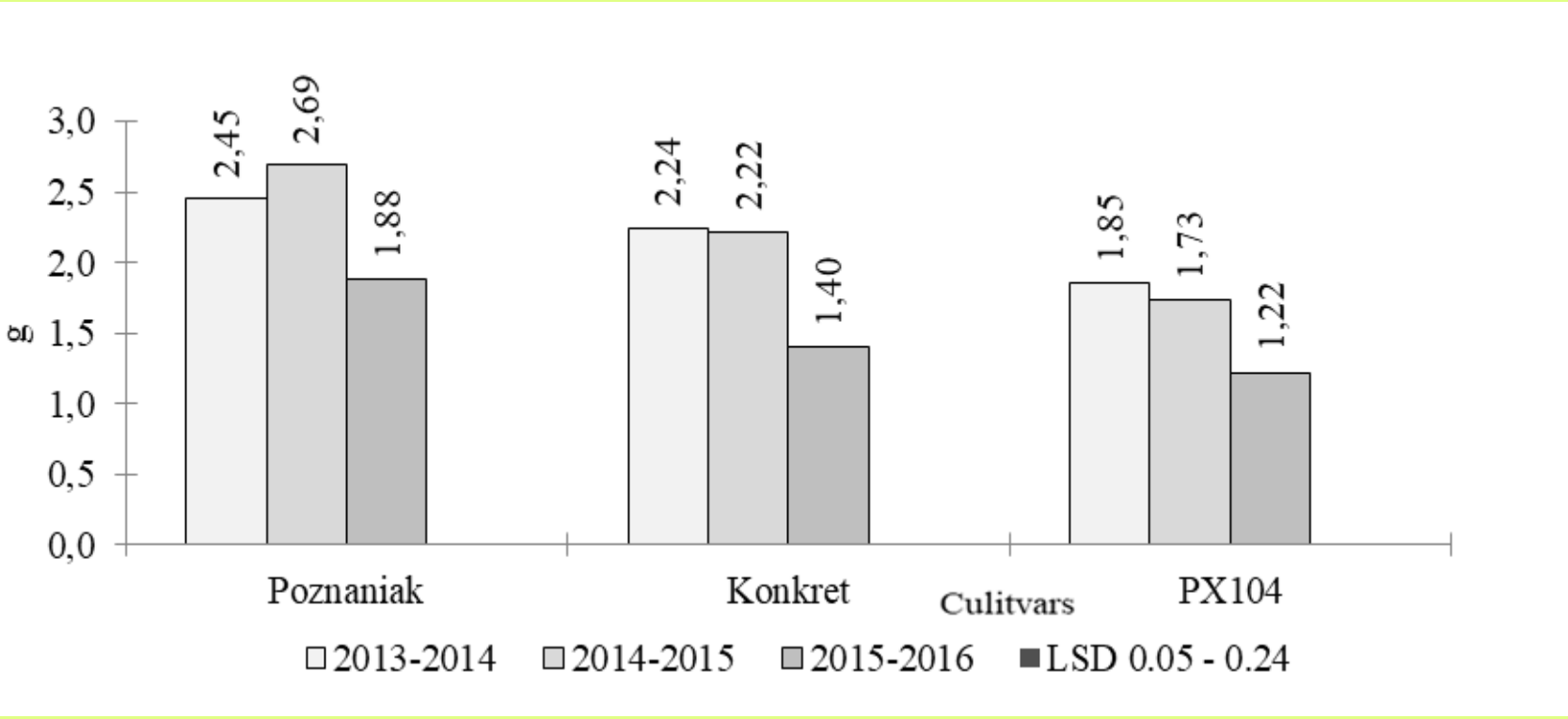

Figure 7. Dry matter of the root system of one plant (g) (interaction of years of research and cultivars)

CONCLUSIONS

- The genetic factor significantly influenced the morphological features of plants, marked in autumn by inhibition of vegetation. The population variety Poznaniak developed more rosette leaves, greater length of the tap root, and fresh and dry mass of the rosette and the root system as compared to the restored hybrids.
- The applied biostimulators significantly influenced plant parameters determined in the fall before the vegetation inhibition. After the use of a biostimulator containing the active substance in the form of sodium o-nitrophenol, sodium para-nitrophenol and sodium 5-nitroguajakol, a significantly higher value of the tested features was obtained compared to the control variant. Regardless of the type of biostimulator used, the height of the growth cone was the same as in the control object.

- The most favourable parameters of the leaf rosette were obtained in the first and second periods of summer-autumn vegetation and winter dormancy, while in extreme drought conditions during sowing and a fairy dry period of emergence, its weakest features were obtained.