THE INFLUENCE OF MINERAL FERTILIZERS AND GROWTH REGULATORS ON FORMATION OF THE SYMBIOTIC APPARATUS OF FIELD PEA VARIETIES IN THE CONDITIONS OF WESTERN FOREST-STEPPE OF UKRAINE

M. I. Bahmat, D. P. Plahtiy, K. S. Nebaba

ORCID M. Bahmat 0000-0001-6119-9218

ORCID D. Plahtiy 0000-0002-2014-9748

ORCID K. Nebaba 0000-0002-4529-3623

State Agrarian and Engineering University in Podilya

E-mail: agronebaba@gmail.com

Abstract. The article presents the main results reached in our study of the influence of mineral fertilizers and growth regulators on individual grain productivity of field pea varieties in the conditions of Western forest-steppe.

Experimental part of the work was carried out during 2016-2018 by the Department of Agriculture, Soil Science and Plant Protection in the experimental field of the Training and Production Center "Podilya" at the State Agrarian and Engineering University in Podilya. The field experiment was laid down in the research ten-digit crop rotation. Soil of the experimental field was the typical black earth, characterized as deep, low-humus, and heavy gravel on forest-like loams. It had the following physical and agrochemical properties: in the 0-30 cm soil layer soil density was 2.55-2.62 g / m3; density of soil consistency was 1.17-1.25 g / m3; total porosity was 51.6-54.7%; nitrogen content (measured by the method of Corfild) was13.6-14.2; phosphorus and potassium (measured by the method of Chirikov) 15.7-16.4 and 22.4-26.3 mg per 100 g soil, respectively.

The present experiment was conducted with a view to find out the effect determined by three factors: A) variety (Gotovsky, Fargus and Chekbek); B)

fertilizer (P30K45 (control), N15P30K45, N30P30K45); C) growth regulators (without processing (control); Plantag (25 g/ha), Emistim C (30 ml/ha), Pennant (30 ml/ha)).

The experiment was conducted at different growth stages of field pea: BBCH 65-69 (full bloom, 50% of flowers open until the end of blooming); BBCH 71-77 (10-70% of beans have reached the typical length; they are watery and easily squashed); BBCH 81-88 (10-80% of beans reached, seeds have a varietal color, are dry and hard), BBCH 97-99 (harvesting).

The results indicate that Fargus had the highest plants (92 cm). The Gotovsky variety demonstrated the largest number of flowers (13.6 per plant).

Obtained data also indicate that application of Plantapeg growth regulator has only had a slight effect on the number of beans per plant. In particular, number of beans per plant at BBCH 71-77 was recorded higher in the Gotovsky variety (6.3 beans) followed by Chekbek (5.8 beans), and Fargus (5.1 beans), with application of $N_{30}P_{30}K_{45}$ (control) fertilizer combined with Plantapeg growth regulator.

Highest grain weight per plant was recorded with combined inoculation of Vympel growth regulator and repeated dose of mineral fertilizer in the Gotovsky variety (4.33 g). Lowest seeds weight was recorded in the Fargus variety (4.12 g) with the same combination of mineral fertilizer and growth regulator.

The co-inoculation of mineral fertilizer and growth regulator also determined an increase in 1000 grain weight (Seeds Index). The average weight of thousand seeds of the Gotovsky, Chekbek, and Fargus varieties on the control site was 249.5 g, 261.1 g, and 231.4 g, respectively. Thousand grain weights were recorded higher in all three varieties after inoculation of $N_{30}P_{30}K_{45}$ mineral fertilizer and growth regulators. In particular, we recorded an average increase 2.04%-3.03% for the Gotovsky variety, 0.98% -1.54% for the Chekbek variety, and 1.4% -2.19% for the Fargus variety.

The best results for most indicators were obtained in combinations of mineral fertilizers at a dose of $N_{30}P_{30}K_{45}$ and Vympel growth regulator.