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INFLUENCE OF PLANTS GROWTH REGULATORS AND BIOLOGICAL PRODUCTS PERFORMANCE PEA (Pisum sativum L.) IN THE UKRAINE SOUTHERN STEPPES.

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The effect of plant growth regulators (AKM, Humaksyd) and biological product (Ryzobofit) on the growth, development and symbiotic nitrogen fixation pea. Found that the use of these drugs for pre-treatment of seeds and growing plants induce symbiotic nitrogen fixation, stimulates photosynthetic activity, increased net photosynthetic performance and increases the yield of peas in low hydration Steppe zone of Ukraine.

Pea seeds, growth regulators, biological products, symbiotic nitrogen fixation, photosynthetic potential, net photosynthesis productivity, yield.

Intensification of symbiotic nitrogen fixation process is one of the actual problems of modern agriculture. Nitrogen deficit has a negative effect on the intensity of synthesis of nitrogenous organic compounds (proteins, enzymes, nucleic acids), photosynthetic mechanism functioning, growth processes of the plants, which in turn limit reproduction organs formation, leads to decrease of the yield and the amount of protein in the grain.

Pre-sowing seed treatment with active strains of specific rhizobia and biologically active substances of anti-stress effect is one of the promising ways to solve this problem. Physiological mechanisms of plants growth regulators (hereinafter PGR) influence on growth and development of the plants are presented here on the example of the influence of phytohormones on cell division, photosynthesis and respiration processes, nutrition elements assimilation of grain crops. At the same time the influence of PGR on the effectiveness of biological nitrogen fixation and productivity of leguminous crops is not sufficiently studied.

The goal of the research was determination of the influence of natural and synthetic biologically active substances of anti-stress effect and the Rhizobium bacteria on growth, development, effectiveness of symbiotic nitrogen fixation, and productivity of peas.

The research was held in the experimental field of the Research Institute of agrotechnology and ecology of Tavria State Agrotechnological University during 2012-2014.

The seeds were sown on the research areas of 10 sq. m, placed using partial randomization method. Incrustation was done by the solutions of growth regulators AKM (0.3 l/t), Gumaksid (0.3 l/t), and inoculated by microbe preparation Rhizobophyt (0.5 l/t) at the rate of 20 l of solution for 1 t of seeds. In control variant water was used. Foliar application on the plants was done in the phase of 2-3 stipules and 5-6 stipules at the rate of 300 l/ha. Variants in the research are repeated six times.

Leaf area, photosynthetic potential, mass of dry substance, net photosynthetic productivity, amount of active nodules, indexes of the yield, contents of nitrogen were determined using standard methods.

Application of Gumaksid and AKM growth regulators for pre-sowing pea seeds treatment increased the effectiveness of peas-Rhizobium symbiosis which in turn lead to increase of the amount of nitrogen in vegetative organs of plants by 2.0-2.4 times and by 10-17% in the seeds compared to control. Intensification of nitrogen fixating bacteria allowed bigger accumulation of easily-hydrolyzed nitrogen in the soil, allowing serious decrease of amounts of nitrogen fertilizer application for the next crop in crop rotation. Usage of Gumaksid and AKM for seeds incrustation and foliar applications on peas contributes to formation of 15-43% bigger area of stipules, 17.9-33.6% increase of photosynthetic potential and 23.5-40.1% higher net photosynthetic productivity compared to control variant. Usage of natural humates and synthetic phenolic substances for pre-sowing seeds treatment and vegetating plants of peas grants positive increase of the yield and receiving high-quality pea grain.

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