відповідає мезоморфному типу листків, характерних для найбільш продуктивних посівів. При цьому створюється оптимальна за площею листкова поверхня посівів, яка перевищує контрольну на 53 %. Це ж поєднання препаратів забезпечує зростання вмісту в листках сої суми хлорофілів *a* і *b* на 17 %, зростання кількості судинно-волокнистих пучків у стеблах на 44 %, кількості судин у пучках – на 56 %, що може слугувати покращенню умов водозабезпечення і мінерального живлення.

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ONTOGENETIC DYNAMICS OF GAS EXCHANGE IN THE WHEAT TOP LEAVES

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Wheat is one of the leading food crops in the world and the first in its importance in Ukraine. Today the undisputed fact is established that high productivity of modern plant varieties is provided by intensive activity of their photosynthetic apparatus. Maintaining the proper level of plant organism supply with assimilates for maximizing the genetic potential of his productivity is an essential requisition for optimizing the production process at all stages of ontogeny. However, most studies of relationships between the rate of assimilation activity and productivity of wheat were held on a flag leaf. Regarding penultimate leaf that precedes in appearance of flag leaf, the dynamics of its assimilation activity explored insufficiently. This leaf is fully unfolded during the stem elongation even before the spike appearance, while growth of vegetative organs is the most rapid. This process should be accompanied by increasing demand for assimilates in a source-sink system of plant.

The aim of this study was a comparative investigation of penultimate and flag leaves photosynthetic rate in winter wheat varieties of different grain productivity to determine their role in the production process.

In pot experiment the ontogenetic dynamics of gas exchange rate of penultimate and flag leaves in eight winter wheat varieties originated from Institute of Plant Physiology and Genetics NAS of Ukraine were studied. Leaf gas exchange was registered under controlled conditions (1500 μmol • m-2 • s-1 PPF, 25 °C) at the facility, mounted with the infrared gas analyzer. Nitrogen content in dry matter of leaves was determined by Kjeldahl. At the end of the growing season, the elements of grain productivity structure were analyzed.

It was revealed that the maximum net assimilation rate of penultimate leaf (GS 37) was higher than that of flag (GS 47-51), but during the grain development (GS 71-87) net assimilation rate of penultimate leaf reduced dramatically and was lower then in flag leaf. The flag leaf net assimilation rate during flowering and after this was the highest in plants of Astarta variety and the lowest in plants Kalancha variety (except flowering stage). At the stage of wax ripeness the lowest rate of photosynthesis was in plants of Natalka, Kalancha, and Khurtovyna varieties, and the largest — in Astarta, Vinnychanka, and Prydniprovska varieties.

The linear correlation was found between nitrogen content in flag leaf and net assimilation rate during the period earing–wax ripeness of grain. By approximating of trend line it was determined the lower physiological limit of nitrogen content in the leaf for photosynthetic CO2 assimilation, which is about 0.7 % of dry weigh.

It is shown that the rate of flag leaf transpiration during the period of grain filling was more stable than the rate of photosynthesis. This accounts for less stomata apparatus dependence on nitrogen content in the leaf that gradually decreased due to this element remobilization to grain.

The correlation coefficients for all varieties between CO2 assimilation of whole leaf and grain productivity, as measured by weight and number of grains, accounted for penultimate leaf respectively 0.322 and 0.488 (GS 37), and for flag leaf — 0.655 and 0.826 (GS 61-65).

Thus wheat flag leaf plays a leading role in supplying of ear with assimilates and formation of grain productivity. Its assimilation activity is particularly important in a period of intense growth of grain. Assimilation activity of penultimate leaf is important during the period of stem elongation and ear emerging, when vegetative growth processes are highly intensive, up to unfolding of flag leaf.

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THE REACTION OF PEA'S PLANTS PRO-ANTIOXIDANT SYSTEM ON BIOSTIMULANTS STIMPO AND REGOPLANT TREATMENT

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Peas (Pisum sativum L.) are one of the main leguminous plants grown in Ukraine. The sown square of peas is 0,3 mln. ha and 25% of them is in stepp. Peas are very light-, water- and soil-demanding culture, that's why not realize its genetic productivity potential under adverse environmental conditions, owing to photosynthetic and photophosphorylation processes malfunctioning, changing in water state and development of oxidative defence. The usage of growth regulators normalize the metabolism and increase the crop production. The antioxidant system is very important for plant adaptation, and biostymulants Stimpo and Regoplant increase the plants stress resistance. The aim of presented work was to determine the impact of bioregulators Stimpo and Regoplant on the peroxidation processes, changes of antioxidant enzimes activity, proline content during peas onthogenesis under the conditions of South Steppe of Ukraine.

The seeds of peas Oplot variety (F1) sown with the amount 110 germinating seeds/m2. Seeds of experimental variant were treated with Stimpo (25 ml/t) and Regoplant (250 ml/t), prepared on Liposam solution (5ml/l). Folia treatment with biostymulants was carried out in recomended concentrations at inflorescence emergence stage (BBCH 51-59). The plant sampling was carried out at 2-3 and 5-6 leaves development stages, inflorescence emergence, flowering, development of fruit. It was determined the content of thiobarbiturate-active products (TBAAP) in the leaves with the use of mmolar malonic dialdehyde adsorption coefficient, proline content in reaction with ninhydrin reagent, catalase activity (CAT) evaluated according to hydrogen peroxide content in reaction with ammonium molibdate, peroxidative activity (POx) estimated in reaction of guaiacol oxidation.

Biostymulants Stimpo and Regoplant produsedby State Enterprise ISTC "Agrobiotech" are composite polyfunctional preparations, products of fungi-micromycetes Cylindrocarpon obtisiucuilum 680 biotechnological cultivation from root system of ginseng. Analogues of phytohormones, amino acids, fatty acids, oligosaccharides, microelements, and bioprotective compounds) and Aversectin.