

The Influence of Organic and Inorganic Chemical Compounds on Elemental Content, Bioactive Compounds and Morphological Parameters of Some Field-Grown Winter Wheat Genotypes

Culicov O.-A.^{1,2}, Soran M.-L.³, Lung I.³, Racz I.^{4,5}, Kadar R.⁵, Stegarescu A.³,
Opriş O.³, and Nekhoroshkov P.¹

¹*Joint Institute for Nuclear Research, IIO, Dubna;*

²*National Institute for Research and Development in Electrical Engineering ICPE-CA,
030138 Bucharest, Romania;*

³*National Institute for Research and Development of Isotopic and Molecular Technologies,
400293 Cluj-Napoca, Romania;*

⁴*University of Agricultural Sciences and Veterinary Medicine, 400372 Cluj Napoca,
Romania;*

⁵*Agricultural Research and Development Station, Turda, 401100, Romania*

Wheat (*Triticum aestivum L.*) is one of the most important food ingredients worldwide. However, wheat is not only a source of basic nutrients, such as carbohydrates, proteins, and vitamins, but also a source of antioxidants, such as flavonoids and phenolic acids. The present study investigates the effect of two different treatments applied to eight winter wheat genotypes with different origin grown in field conditions. Both treatments, first using synthetic phytohormone -2,4-dichlorophenoxyacetic acid and the second one consisting of the mixture of microelements as Fe, B, Mn, S and Mg, were applied to wheat leaves at the intensive growth stage (stem elongation-Zadoks stage 31-32) for stimulating growth, development and adaptability. Content of flavonoids, total polyphenols and leaf pigments as well as eighteen micro and macroelements (Na, Mg, Al, Cl, K, Ca, Sc, Mn, Fe, Zn, Br, Rb, Sr, Mo, Sb, Cs, Ba, Th) was determined in leaf plant randomly harvested after 10 days of foliar application. Antioxidant activity of the plants and such morphological parameters as (ear length, number of grains/ear, grain weight/ear, moisture, protein, gluten content of the grains, Zeleny sedimentation value and hectolitre mass) were investigated. Basic mineral fertilization applied in autumn after plant emergence was considered as control treatment. Differences between impact of different treatments was revealed.