

Research and formation of qualitative hydro air ion composition in agricultural premises

Serhii Sukach 1 , Tatyana Kozlovskaya 1 , Ihor Serhiienko 1 , Valentyn Glyva 2 , Oleksandr Vovna 3 ,Ivan Laktionov 3*

1 Kremenchuk Mykhailo Ostohradskyi National University, 39600 Kremenchuk, Ukraine

2 National Aviation University, 02000 Kiev, Ukraine

3 State Higher Education Institution “Donetsk National Technical University”, 85300 Pokrovsk, Ukraine

** Corresponding author: ivan.laktionov@donntu.edu.ua*

Abstract

Sukach, S., Kozlovskaya, T., Serhiienko, I., Glyva, V., Vovna, O., & Laktionov, I. (2019). Research and formation of qualitative hydro air ion composition in agricultural premises. Bulgarian Journal of Agricultural Science, 25(2), 256–263

An approach to establishment of the mechanism of formation of air and hydro air ions on the example of greenhouses has been studied and proposed. Ways of determining energy of ionization (formation) of air ions by energy values of breakdown of chemical bonds have been shown in order to evaluate the probability of formation of air ions of different chemical structures. It has been established that the use of a small ultrasonic air ion generator helps to normalize air ion composition of the air without generation of harmful substances and purifies the air from fine particles that absorb air ions and reduce electrification of dielectric surfaces. Due to the balloelectric effect, the negative effect inherent in most existing ionizers (generation of ozone and nitrogen oxides) minimizes, which improves the quality of the internal air and, thus, increases level of comfort and efficiency of workers of agro-industrial complexes. Intellectual internal air quality control system with the use of fuzzy-logic has been developed and implemented. The optimality criterion of the control system for working zone comfort and standardized parameters of microclimate and air ion concentration in the working zone have been proposed.

Keywords: *air quality control system; air ion concentration; air ionization; air quality; ventilation system*