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PEDAGOGICAL AND PSYCHOLOGICAL ASPECTS OF IMPROVING ATTITUDES TOWARDS ECOLOGY AND ENVIRONMENTAL PROTECTION AMONG UNDERGRADUATE STUDENTS IN AGRICULTURAL CHEMISTRY CLASSES

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Annotation
This article presents the results of pedagogical and psychological research conducted to improve ecological culture and knowledge of environmental protection among undergraduate students in agricultural chemistry classes.

Keywords: pedagogy, psychology, agrochemical, ecology, environmental protection.

Agrochemistry is a science that studies the cycle of substances in the “soil-plant-fertilizer” system, as well as their impact on the quality of agricultural products and environmental problems in the area of jurisdiction of the agricultural sector of the state economy. The term agricultural chemistry was introduced in 1813 by the English chemist and geologist Humphry Davy.

Agrochemistry - an academic discipline about chemical processes in soil and plants, mineral nutrition of plants, the use of fertilizers and chemical soil reclamation agents. Includes determination of the content of chemical elements, proteins, amino acids, vitamins, fats, carbohydrates in soils and plants; establishing the mechanical and mineralogical composition of soils, the content of organic matter (humus), salts, algae, microorganisms, etc. It studies the effect of fertilizers on plants and soil and also includes:

– Environmental problems and functions of agrochemistry. Economic and energy efficiency of using agrochemicals.
– Environmental assessment of agrochemicals. Ways of possible environmental pollution with fertilizers.
– Ecological functions of agrochemistry.

Among the life factors of plants, mineral nutrition is most amenable to regulation during their cultivation. For normal growth and the formation of high productivity of plants, nutritional elements are not enough, therefore, to eliminate plant

starvation and increase yields they need to be added in the form of various substances. Substances used for improving plant nutrition is called fertilizers. In modern agriculture, fertilizers are an integral part of agricultural technology, the greening of agriculture, the sustainability of agroecosystems, and a means of regulating the cycle of substances in the agricultural landscape.

For the study of agricultural chemistry, knowledge of botany, physiology and plant biochemistry. The transformation of fertilizers in the soil is associated with its properties, as well as the chemical and microbiological processes occurring in it, which is studied in soil science, chemistry and soil microbiology. Fertilizer application methods are closely related to processing methods, soil, weed control, crop rotation, scientific basis which are studied in agriculture. They are also associated with the biological characteristics and technology of cultivation of individual crops, which is studied in crop production Finally, the correct application of fertilizers requires knowledge of land reclamation and agrometeorology.

Laboratory methods for agrochemical analysis of plants, soils and fertilizers include biochemical, microbiological methods, as well as the method of isotope indicators (stable and radioactive isotopes). The leading role among laboratory methods belongs to the chemical analysis of agronomic objects.

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Agrochemical quantitative analysis of plants, soils and fertilizers is based on methods of general chemical quantitative analysis, but it also has its own specifics due to the existing characteristics of the research objects. An exceptionally wide range of elements, chemical inorganic and organic compounds in plants, soils, as well as individual fertilizers creates significant difficulties in conducting their quantitative analysis.

In agrochemical research, all existing methods of quantitative analysis are used, but it is especially common in the system of agrochemical services for agriculture to use, along with chemical methods, such instrumental methods as photometry and potentiometry. Agrochemical analysis of plants is necessary for: assessing the quality of crop yields and its changes depending on growing conditions, including the use of fertilizers; determining the amount of nutrients removed from the crop and the progress of their consumption during the growing season; diagnosing plant nutrition and determining the need for fertilizers; studying the use of nutrients from fertilizers by crops.

Agrochemical analysis of soils is carried out with the aim of: establishing the supply of plants with nutrients and, consequently, the need for fertilizers; studying the properties of soils, which determine the fundamental issues of using fertilizers and carrying out chemical soil reclamation, such as absorption capacity, soil reaction and buffering capacity (i.e. the ability to resist changes in reaction), salinity, etc.; monitoring changes in the content of nutrients in the soil and their availability to plants depending on agricultural practices and the use of fertilizers; studying the processes of interaction of fertilizers with soil. Agrochemical analysis of fertilizers is used to: assess the quality of local organic fertilizers and its changes depending on the conditions of accumulation, storage and use; determining the content of the active substance in industrial mineral fertilizers and reclamation materials to verify their compliance with established standards; determining the availability of nutrients from fertilizers and studying the processes of their transformation in the soil. Agrochemical analysis of plants, soils and fertilizers makes it possible to study the state of the balance of nutrients in agriculture and scientifically substantiate the regulation of crop nutrition using fertilizers.

To assess the accuracy of experiments and the reliability of the results obtained, to identify the relationship between fertilizers and yield, to model the processes of absorption by plants, transformation in the soil and losses of nutrients from soil and fertilizers, and the economic assessment of the use of fertilizers in agrochemical research, mathematical methods are used. Based on the results of field and production experiments with a mandatory economic assessment of the studied fertilizers and methods of their application, practical recommendations are given to production. The application of agrochemistry in agricultural practice is carried out mainly through the effective use of a variety of local and industrial fertilizers.

Conclusion

Based on the above, it can be assumed that the introduction of environmental views in students' agrochemistry classes forms and develops the concepts of environmental conservation.

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