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Editorial

Engineering Innovations in Agriculture

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Nowadays, the expansion of people into intact primary areas has been observed alongside an increase in the area of land devoted to crops, pastures, etc., which has led to the destruction of natural diversity. A solution to avoid disaster is to increase agricultural production efficiency in order to expand crop harvest and livestock productivity without deteriorating their quality. This approach requires introducing innovative engineering technologies to agriculture. Fortunately, technology is developing rapidly, and new driving scientific forces are emerging in various fields of agriculture, which has allowed significant inroads to be made in the development of all fields of agroengineering science.

This Special Issue, titled "Engineering Innovations in Agriculture", consists of high-quality articles from academics and industry-related researchers in the field of agricultural engineering, covering the following topics: harvesting and planting crops, livestock production, livestock and agrifood waste utilization, seed treatment and transportation, agricultural robotic applications, solutions for digital and precision agriculture, energy efficiency and conservation in agriculture, agriculture mechanization and electrification, harvest technologies, postharvest technologies, renewable energy technologies, robotics, etc. The presented studies were carried out by scientists and researchers from around the world and have been held in high regard by peer reviewers in their respective fields of knowledge; the main objectives of the published works can be found below.

The first study [1] showed that, during the heating period, the application of the ceiling fans helped to raise the air temperature and to reduce relative air humidity in the areas where young stock is located, in accordance with the normative indicators. In [2], soybean seed particles of three varieties with different sphericities were taken as the research objects. Through the simulation analysis of repose angle and self-flow screening, it was shown that the above two parameters needed to be accurately calibrated. In [3], the authors investigated the effect of impulse (frequency 1000 Hz and duty cycle 67%), scanning (the principle of running lights), and constant 16 h and 24 h modes of operation of white light LED irradiators on the physiological, biochemical, and morphometric parameters of lettuce with red and green leaves, in order to optimize the parameters of the mechanism, reduce the pressure loss and improve the efficiency of pneumatic utilization. In [4], the principles and types of pneumatic loss in different areas were defined, and the key parameters, including the diameter of the horizontal air pipe, the angle of the air pipe, and the diameter of the negative pressure aperture, which affect the pressure loss, were analyzed. The article in [5] presents a methodology for conducting research to assess the influence of working bodies on the magnitude of the force impact on potato tubers and soil clods during harvesting, using a methodology for assessing the dynamic destruction of soil clods. In [6], the authors synthesized Mn^{4+}-doped $CaSb_2O_6$ phosphors using the conventional solid-state reaction method for plant growth lighting applications. A counting method for red jujube based on the improved YOLOv5s was proposed in [7], which realized the fast and accurate detection of red jujubes and reduced the model scale and estimation error. In [8], the effects of the

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working pressure and aspect ratio (L/D) of circular and non-circular nozzles (diamond and ellipse) on water distribution and droplet kinetic energy intensity were investigated. In [9], the authors first presented the "cut-and-paste" method for synthetically augmenting the available dataset by generating additional annotated training images. In [10], the authors investigated the optimal design for an agricultural mobile robot's suspension system based on a double wishbone suspension structure. In the work presented in [11], the authors investigated the use of pyrolysis to recycle amaranth inflorescence wastes. The results indicate that the application of pyrolysis will allow the efficient conversion of amaranth inflorescence wastes into value-added products. The article in [12] presents the results of developing and testing the air-cooling system of a combined climate control unit used in pig farming. The authors found a water-evaporative system to be the most efficient for cooling the air supply. The experimental studies presented in [13] using a developed harvester with an experimental separating system made it possible to ensure the high-quality harvesting of potato and onion tubers. In [14], a method for determining the degree of infected seeds with Fusarium was developed. In [15], carbon emissions, customer satisfaction, customer value, and cost were considered, and an optimization algorithm was established to solve the time-dependent vehicle routing problem in urban cold chain logistics. In [16], each biomass sample of the redroot pigweed (leaves, inflorescences, and stems) was pyrolyzed in a lab-scale furnace, in a nitrogen atmosphere, under non-isothermal conditions. The results will help us to better understand the thermal behavior of redroot pigweed biomass and its utilization for fuels or chemicals. In [17], the authors propose a method to reduce the feed rate by decreasing the feed length of the stalk and design a double-cutter bar combine header. The purpose of the study presented in [18] is to identify and evaluate the effect of high-voltage electrical pulses on the irreversible damage to the intracellular structures of the plant tissue of weeds and unwanted grasses during electric weed control, characterizing and evaluating the parameters and modes associated with such processing. The article presented in [19] is devoted to questions of increasing the efficiency and attractiveness of solar photovoltaic equipment for the purpose of ensuring the appropriate conditions for widespread power supply to agricultural consumers through the use of solar energy.

Thus, the presented works contribute towards solving issues regarding the development, research, and optimization of engineering innovations in agriculture, where their results will be of interest to specialists, researchers, and scientists in the considered areas. Of course, only a small area of the issues that are relevant today are touched upon in this Special Issue, titled "Engineering Innovations in Agriculture"; however, the authors have carried out important work, which will make a significant contribution to solving issues related to engineering innovation in agriculture in the future.

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