BASIS OF PREPARATION OF EFFECTIVE FERTILIZERS AND AGROCHEMICALS METHOD OF DISCRETE-PULSE INPUT ENERGY

B. Draganov

Y. Borhalenko

The mathematical model of heat and mass transfer and hydrodynamic processes specified discrete input pulse energy. The analysis of data obtained by the SFD model. The specified level of efficiency of fertilizers and agrochemicals during their homogenization discrete input pulse energy.

Mathematical modeling, agrochemicals, SFD model discrete input pulse energy, Navier-Stokes equations.

The aim - to develop a method of improving the efficiency of fertilizers and agrochemicals, powered discrete input pulse energy.

Material and methods. Agrochemical plant life means using agrochemicals are an effective way to increase productivity of crops grown. One of the factors that determine the effectiveness of heterogeneous usually agrochemicals is their level of homogeneity. The most effective technology both in regard to energy and the degree of homogeneity of the components based on the concept of discrete input pulse energy.

The Institute of Engineering Thermophysics NAS of Ukraine method of discrete input pulse energy is widely used in many industrial processes. This article presents some of the first results using the provisions of discrete input pulse energy in agriculture.

In technology discrete input pulse energy is used on equipment. In this case, used rotary pulsation apparatus (RPA). The design of the streaming device.

The system of equations (Navier-Stokes), written in cylindrical coordinates, the equation of motion includes:

The equation of energy corresponding to the first law of thermodynamics to elementary volume mobile environment. For the case in dealing with internal rate of

accumulation and the kinetic energy is determined by the speed of the cart and heat rate performance:

It is proved that the dynamics of a particle in bulk liquid described equations of hydrodynamics and heat-mass transfer. For nestykovanoyi fluid movement in our environment (at the interface limits the distribution of the liquid phase) can use the Rayleigh-Lamba equations for which are defined boundary conditions (density - 1,34-1,01 g / cm3, mixing 500-750 c) for discrete input pulse energy:

Computer modeling of mixing 15 liters of fertilizer UAN 30 liters of water and set the best time of the operation, which is required for high homogenizing solution and prevent inefficient energy costs (Figure 2). Based on the analysis mixing process derived from computer modeling, concluded that homogenization two-component medium "liquid-liquid" occurs in the period from 120 to 720 since the beginning of time with mixing and mixing time increased to 3600 with no changes density CAS solution, and the fact and extent of mixing. In the process of mixing the solution for the first 2.5% of the total mixing time there is a change in the density of the solution 90.9% and 97.5% for the remaining time solution density is changed to 9.1%.

It is proved that the flow of fluid in radial and axial directions absent, and Navier-Stokes takes the following form:

Osnovnympokaznykom quality mixing mixture is the degree of dispersion and particle size of the material.

For the parameters t = 0 - 3600 c, ρ = 1,34 - 1,01 g / cm3 built response surface density of the solution depending on the time of mixing fertilizer UAN.

Optimal parameters mode of RPA stirring solution of fertilizer UAN characterized point "A" on the surface response.

Analysis of the results of computer modeling and experimental research in the process of mixing approaching homogenous within the time from 120 to 720 s.

Based on the analysis charts homogenization fertilizer CAS determined the dependence of parameters and optimal operation of the RPA.

Theoretical and experimental studies show that the use of fertilizers CAS, the principle of mixed discrete input pulse energy is promising in terms of energy and resource conservation.

Conclusions

As a result of computer modeling and experimental study of heterogeneous environments shows that the effective use of the principle of discrete input pulse energy. In the process of mixing the solution for the first 2.5% of the total mixing time there is a change in the density of the solution 90.9% and 97.5% for the remaining time density change by 9.1%. Using the principle of discrete pulse energy input for the preparation of agrochemicals solutions made it possible to use different types of energy impact on the work environment to achieve a high degree of Goma