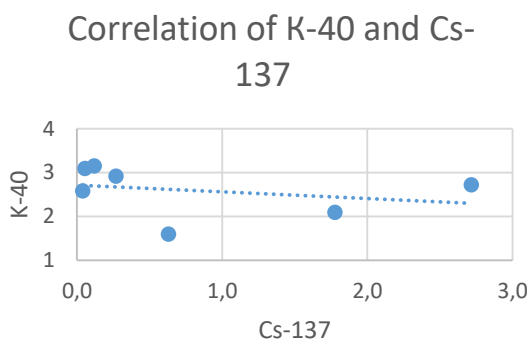


INVESTIGATION OF THE PROBLEM OF MUTAL CORRELATION OF RADIOISOTOPES OF POTASSIUM-40 AND CESIUM-137

In this paper, we consider the features of the biological cycle of ^{137}Cs and ^{40}K reconstructed under laboratory conditions in order to identify and describe mechanisms of mutual correlation of these two radioisotopes in the system "substrate-plant". Actuality of work - show the importance of understanding the correlation of the "basic" element of K-40 and appropriate to the radioisotope-pair Cs-137 in phyto-agrocenoses for correct modulation of interchange in the trophic chains of these elements, as well as to find ways to limit the flow of "undesirable" elements in crops, and consequently in food and feed for livestock.

The main task of the research was to prove or disprove the hypothesis of the presence of a mutual correlation of potassium-40 and cesium-137 in agrocenoses. The study was based on a laboratory experiment with the water culture of corn fodder, in the course of which the latter are subject to internal and external radiation. All necessary calculations were made in the software package "MS Office World"

As a result of the experiment, it was possible to find a stable correlation in the mutual movement of radioactive isotopes of potassium-40 and cesium-137 in the system "Water Substrate – Plant". This is shown on the chart below.



This allows us to assume that the introduction of potassium fertilizers enriched in the K-40 radionuclide in the soil (or any other substrate) will make it possible to secure the receipt of the unwanted radionuclide in the green mass of the plants, and hence the feed and food obtained from it. This technology was much simpler and cheaper than the technically complex technology of land reclamation (for example, the territories affected by the Chernobyl accident) using other crops or direct removal of a polluted ball of earth. The introduction of potash fertilizers does not purify the soil from radionuclides of cesium-137, but protects the consumer against possible contamination of the products.

Negative features of this method of protection from the receipt of radionuclides in agricultural products is:

- 1) the selectivity of the method - in the event that the soil contains several types of radionuclides. For example: Cs-137, Sr-90, Am-241, etc.
- 2) secondary pollution, which appears as a result of excessive application of fertilizers.
- 3) The deleterious effect of excess potassium in the soil directly on plant crops, as well as on the agroecosystem as a whole.

Scientific supervisor: Kharytska S.V., PhD, Associate Professor