

Ekomonitoring heavy metals of soil polluted, phytoremediation bulbous cultura and technology of vegetable remains recycle

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It is well known that quick extraction of minerals is polluting the environment so rapidly that the aliments extracted from surrounding soil are extremely harmful for human organism in most cases. This means that this soil is practically useless for agricultural purposes. Therefore the purification of this type of soil is a major concern. In eastern Georgia, in Bolnisi region, where the extraction of gold and copper is ongoing, nearly 150 ha is extremely polluted with copper, cadmium and zinc. In Zestaphoni, western Georgia, 300 ha is also polluted where the extraction of manganum and other non-ferrous metals takes place.

In our opinion, the cheapest method for the purification of this kind of soil among effective and widely accepted methods all over the world is the phytoremediation. The aim of the project is to extract dangerous elements from soil by using the crops after processing of which the final product received shall be free from those elements. His crop happens to be the sugar beet. It has been proven that the spirit - final product of the processing of sugar beet cultivated on the soil polluted by metals, does not contain radionuclides.

It is well known that sugar beet extracts cadmium and other heavy metal from soil quite well. If we suggest that the volume of extracted elements is directly proportional to sugar beet itself and its leaves' mass, it will be much effective to use a bio activator, which ensures the latter.

Model testing (laboratory) as well as field testing will be performed. Optimal conditions (processing seeds, exposition, substance concentration, agro-climate conditions, etc.) for extracting cadmium from soil by the sugar beet with the new technology will be identified. Relevant phenological research and biometric calculations will be conducted. The results will be confirmed by chemo-ecological analysis. Practical recommendations regarding implementation of new eco-biotechnological method in practice will be developed.

One of the important issues to consider remains the utilization of residual mass after obtaining ethyl spirit, as it contains dangerous elements for health. In the institute of physics, where the exploitation of cryogen equipment is very well developed, there is an option of obtaining spirit by using low temperature equipment. With this equipment, we shall obtain the low concentration spirit, dry the residual mass and use the latter as a fuel for increasing the concentration of spirit. Specific heat of combustion is calculated precisely and therefore it is possible to calculate exact economic effect. This is extremely important based on the fact that 50% of spirit self-value represents the cost for its production