

C1. DESCRIPTION FOR THE GENERAL PUBLIC

Ongoing pollution of the environment, affecting not only industrial areas, but also agricultural areas poses new challenges (Wierzbicka 2015). A particularly important issue is to get healthy and uncontaminated food. On the market there are more and more of biostimulators (activators) and fertilizers of different kinds, which are intended to improve the quality of the agricultural products. In contrast, there are no formulas that protect plants against the penetration of harmful contaminants such as heavy metals.

Biostimulators are formulations containing various types of growth regulators, which may also contain macro- and microelements. The biostimulators regulate biochemical and physiological mechanisms of plants. The ideal solution both for the problem of penetration of heavy metals to plants, as well as a obtaining a high quality yields would be the application of such formulations (activators), which could promote the uptake of needed nutrients in plants at the cellular level and at the same time inhibit the intake of heavy metals, eg. lead.

One of the factors limiting the lead uptake from the soil by plants is the presence of high levels of calcium in the medium. The mechanism of this process involves the limitation of availability of heavy metals in soil. By contrast, foliar application of biostimulating calcium fertilizer as a protection against heavy metals appears to be of particularly interesting. Such preparation is an activator of calcium transport, using patented technology, which supports uptake of calcium and its transport at the cellular level. Our initial studies have indicated that by supporting the calcium transport in plants, the activator may limit the lead penetration into the plant at the same.

The aim of the planned research will be to verify the extent to which the studied activator of calcium transport inhibits the uptake and transport of lead by crop plants **(1)** and to gain knowledge of the mechanism of action of this preparation **(2)**. Confirmation of the protective effect of the tested activator of calcium transport at the plant would mean the possibility of using it not only to improve the quality of crops (due to the increased amount of calcium in plants after the application of this preparation which prevented the occurrence of physiological disorders in plants and extended the firmness after harvest of agricultural products). It would be also possible to reduce the penetration of heavy metals in the biological cycle, which is what we want to check. This type of study, in view of growing problems with contamination of food are of great cognitive value and can contribute to the creation of effective protection of crops from progressive environmental pollution.

References:

Wierzbicka M. 2015. Ecotoxicology. Plants, soils, metals. Warsaw University Press, Warsaw. (in Polish).