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Micronutrients organic seed production of vegetable plants

Mikroelementy w ekologicznej produkcji nasion roślin warzywnych

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One of the more important conditions for obtaining high quality yields of seeds in the organic production of vegetable plants is not only to provide plants with essential nutrients (macronutrients) but also to cover their needs for micronutrients. Increased absorption of these elements by the vegetable plants, grown for seeds, is associated with the intensification of metabolic processes during the transition from the vegetative to generative, flowering and seed production.

The use of macronutrients is becoming increasingly important especially in the ecological systems of cultivation of seed plants, because they determine the effective use of nitrogen, phosphorus, potassium and other macronutrients in the development of biomass and seed formation on mother plants. Microelements, as components or activators of enzymes, are involved in many metabolic reactions and fulfill important physiological functions in plants.

Our findings and the literature reports indicate the positive effects of boron, silicon, titanium and iodine in the production of vegetable seeds. It was found that both boron and titanium affect the development of the generative organs of selected vegetable species, fulfilling an important role in pollen germination and pollen tube growth. It was also shown the positive yield-forming effects of these microelements, used in the cultivation of vegetables belonging to the family Solanaceae (tomatoes, eggplant and peppers), Fabaceae (peas, beans), as well as in cucumber, beetroot, onions and carrots. The foliar application of titanium in the organic vegetable seed production can increase the seed yield even two times, depending on the plant species, compared to the untreated objects (controls). Titanium induced metabolism of plants and their resistance to stress and disease (especially powdery mildew and fusarioses).

The use of silicon-containing formulations in cultivation of lettuce for seeds, as well as in eggplant and tomato effected on improving the quality of the seeds and their health. Silicon largely limited the infestation of seeds by pathogenic fungi. The significantly reduced infestation of mother plants by diseases, compared to the control, increased the yield of seeds.

The results of studies on the application of formulations containing iodine in biconditioning of seeds of cabbage vegetables showed an improvement in their sowing value. Iodine applied to leaves in cabbage crops stimulated the resistance of plants and positively affected the quality of the crop and the metabolism of plants.

Deficiency of these micronutrients leads to lower resistance of seed plants to adverse environmental conditions and disease and decline in seed yield and deterioration of its quality.

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