

TRACE ELEMENTS PRODUCED USING NANOTECHNOLOGY

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One of higher priority scientific directions in the field of nanobiotechnology has been started by The Ukrainian State Scientific Research Institute of Nanobiotechnologies and Resource Reservation.

Development of this direction made it possible to synthesize and industrially produce basic essential trace elements (Zinc, Magnesium, Manganese, Iron, Copper, Cobalt, Molybdenum, Chrome, Vanadium, Silver, Selenium, Germanium) in safe bio-digestible forms with high bioavailability, that is similar to forms, synthesized in nature. Natural acids such as lemon acid, lactic acid, succinic acid, malic acid, tartaric acid are used as a chelating agent.

These trace elements, as a base, are already widely used in following fields: 1) fortification of products for general consumption - flour, salt, sugar, soft drinks, drinking water 2) product bio-fortification for mass consumption - mineral premix for animals 3) special purpose products production for people with elevated risk of disease emergence for people working in hazardous industry 4) fortification of vegetable products (all grain crops, vegetables), using microelements in pre sowing seed processing and during plant vegetation period.

Efficiency Index for Crop Husbandry, 2012-2013 year

Crop	Crop Yield , center /ha		Yield Growth	
	Control (farm standard)	"Avatar-1" in complex with agrobiotechnology	centner/ha	%
Winter wheat	38,0	55,0	17,0	44,7
Barley	27,9	42,6	14,7	52,7
Sunflower	19,0	25,3	6,3	33,2
Corn	72,0	95,0	23,0	31,9
Soybean	16,2	29,5	13,0	86,6
Pea	18,3	20,8	2,5	13,7
Winter rape	19,5	24,8	5,3	27,2

In accordance with order of Ukrainian Government, there was elaborated «The Complex Program for food product fortification aiming to prevent professional diseases for people working in hazardous labor conditions» (chemists, workers of mining and metallurgic industries). The work on methodology and research was performed in collaboration with Trace Element Institute for UNESCO.

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