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**Olena Struminska, Sergey Kurta (Ivano-Frankivsk, Ukraine), Evgeniya Lobko, Volodymyr Bortnitsky (Kyiv, Ukraine), Oksana Kutsela, Tetyana Kozak, Maria Bayliak (Ivano-Frankivsk, Ukraine)**

## BIOPOLYMER COMPOSITIONS - ONE OF THE WAYS TO IMPROVE CROP YIELDS

The use of biopolymers in different fields is becoming more important. Therefore the aim of our research is to study the impact of biopolymer compositions on the growth and yield of agricultural crops, a description of their characteristics, and also study of their effects on various types of microorganisms, which presence can lead to seed damage and disease. Starch, sucrose, sodium carboxymethylcellulose (Na-CMC) and xanthan decompose in the soil and are a source of mono- and disaccharides which are used for plant nutrition. Compositional films on their basis do not bung seeds, and due to their structure quickly dissolve in water. Sucrose as a film-creator should be used in caramelized state (from 72 to 83%), as it provides more film thickness - up to 25 microns. At these values it holds in its structure such quantity of mineral compounds (from 25-30%), at which there is observed the greatest yield capacity increase. The optimal concentrations of Na-CMC working water solutions are equal to 0,5-1%, for xanthan - from 0,125 to 0,25%, for starch - 1-4%, at which are in easily flowable sol-state, which is a prerequisite for the formation of the optimal film thickness (from 15 to 19,5 microns) on the surface of seeds.

At drying caramelized sucrose solutions to the powdered state it is lost to 17-20% water relatively its initial content. In the case of phased drying under vacuum at 50-51$^{o}$C are obtainable dry powder composition which are more convenient to use. In particular, managed to obtain compositions with the contents: from 64 to 81% sucrose, 34 to 19% of mineral compounds and to 1,3% of water; 1,5-2,15% xanthan, from 86,85 to 93,55% of mineral compounds and 4,3-11,65% water; 3-4,30% Na-CMC, from 82 to 90,7% of mineral compounds and 5-15% water; 4-9% starch, 89-91% of mineral compounds and 2-5% water.

The melting point of the compositions is significantly lower than the corresponding biopolymers. For example, the melting point of the sucrose compositions is lower by almost on 70 □C than the same film-creator, that was defined by differential thermal analysis, DTA.

Aqueous solutions of compositions of the studied biopolymers with mineral compounds in their composition exhibit bactericidal and partly fungicidal properties. In none of the powder samples of biopolymers and their solutions intestinal bacteria and mold fungi were not revealed. The number of microorganisms grew in 7,5 times lesser in the sown samples based on xanthan on meat-peptone agar than when sown net xanthan solution. In the case of carboxymethylcellulose, sucrose and starch quantity of grown bacteria on appropriate compositions was in 5,5 and 2,7 times lower than in the net biopolymers. Thereby there is an unauthorized mordant seed crops from pathogenic organisms. Carboxymethylcellulose and its salt are able to metabolize by a very small number of microorganisms. Therefore in its powder and solution samples was found a significantly lower their number.

Expense of fertilizers consisting of biopolymer compositions on 1 hectare of crop area decreased by an average in 10-50 times. This avoids saturation of soil by fertilizers and thereby somewhat to improve the ecological situation. Is also expected to increase crop yields, particularly soybean, sunflower and corn, to 75-80% relative to control plants.