Effect of vitamin Group P, the similarity and morphological characteristics of maize seedlings

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The effect of B vitamins for energy R germination and seedling morphological characteristics of different corn breeding material.

Rutin, Quercetin, growth promoters, vigor, linear corn plant, original form, 3 - line hybrids.

Updating of organic farming is pushing to accept new technological aspects of the impact of the environmental friendly products. For Ukraine, along with the improvement of the nation, it also is extremely important in determining its rightful place in the integration processes of the European Community and other countries. Understanding this is already realized in making September 3, 2013 the Law of Ukraine № 425 "On the production and circulation of organic agricultural products and raw materials" which seeks to reduce the use of crop protection chemicals and natural search methods to protect them.

In particular, paragraph 6 of the Act regulates the use of certified seed and planting material for the production ekoorganic products. In the first article of this law states that during the production of organic products is necessary to exclude the use of chemical fertilizers, pesticides, GMOs, preservatives, etc. substances at all stages of the cultivation and processing of agricultural products.

It is clear that the alternative use of chemical plant protection during storage, preliminary treatment and germination should be proposed natural substances or physical effects that will not only protect plants from biological effects and environmental influences but also manage their ontogeny at different stages in life

cycle. These substances can be both natural origin (animal, plant, microbial, bacterial, etc.) and synthetic. Each group of substances has a number of advantages and disadvantages [1].

The natural compounds include: drugs based on humus and fulvic acids, plant hormones, vitamin and amino acid mixture of micronutrients, natural surfactants [2] and other natural biologically active substances. By synthetic stimulants regulators include chemicals of different structure - analogues of natural stimulants, surfactants [3], a mixture of organic acids (eg arachidonic) or their derivatives.

Last time there that focus on the use of extracts of natural origin as stimulants and growth regulators [4]. In modern terms it is becoming more important. One of the promising bioactive substances that exhibit not only the properties of stimulants and growth regulators, but P - vitamin activity and allow better realized genetic capabilities and increase the resistance of plants to stressful environmental factors are bioflavonoids [5].

The aim was to study the influence of bioflavonoids as stimulants and plant growth regulators as an alternative to chemicals for seed treatment.

Materials and methods of research. The material for the research was the seed corn of various selection: homozygous original form "Dnipro SB 257», «RAM 2604"; first generation hybrids "Daniel simple" and "Berezina C" and trilinear hybrids - "Lyubava 279 MB" and "Kremen SB 200", which were of selected scientific production association "Steppe" Dnipropetrovsk region.

Experiments were carried out in autumn 2013 in the laboratory of the Department of Biotechnology UDHTU State University. Sprouting seeds was performed at the optimum temperature for corn + 25°C and oxygen. Corn seeds soaked in a solution of quercetin or rutin (rutin concentration was 10^{-5} M concentration of quercetin - 10^{-5} M) was measured before soaking solution pH: pH solutions routine – 6,33 pH solutions quercetin – 5,70 pH of distilled water – 5,35. In the control seeds soaked in distilled water. The evaluation results of the study conducted under generally accepted methods [6].

Results. Exploring the conditions germination of seeds, we used different amounts of liquid to soak, because all seed corn was different in shape and size. Studies indicate that the maximum number of sprouted seeds observed when the ratio v / m as 1: 1 for all the studied hybrid corn seed. The figure shows the dependence of the number of sprouted corn seed RAM 2604 the ratio of mass to volume of seeds have the same form and shape curves for other hybrids.

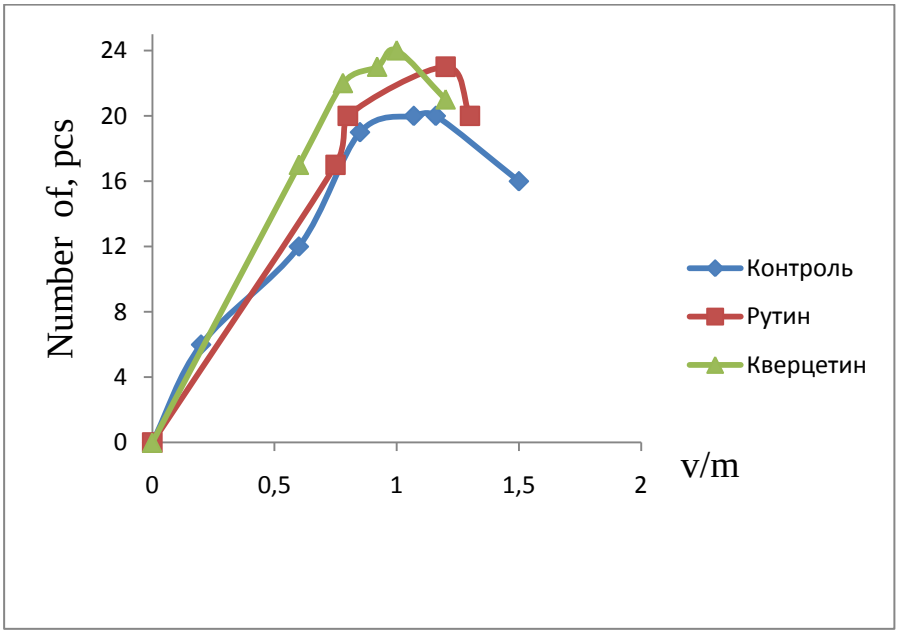

Figure. Dependence of the number of seeds sprouted corn RAM 2604 the ratio of mass to volume of seeds.

We investigated the impact of bioflavonoids on germination and seedling morphological characteristics of hybrid maize breeding of different origin.

Thus, as expected (Table 1), the highest figures for all the features that have been studied trilinear hybrids. Effect of bioflavonoids they showed difference in reaction hole in the line homozygous plants and hybrids of different selection. For germination and root length observed that trilinear hybrids effectively implemented its genetic potential and use bioflavonoids almost no effect on the rate. Use of quercetin and rutin solution preliminary treatment of seeds yielded no positive impact on homozygous and trilinear form. Note that different genetic material homozygous on parental trilinear forms and hybrids are equally responsive to finish their routine, which may be associated with different genetic and biochemical mechanisms:

deficiency of certain enzyme systems in the homozygous form of maize and suppression systems in some hybrid material.

Table 1. Effect of quercetin and rutin on germination and morphological characteristics of different maize breeding origin

Title breeding material	Germination,%			Length of seedlings , mm			The length of the root, mm		
	control	rutin	quercetin	control	rutin	quercetin	control	rutin	quercetin
Original form of maize									
SM 264 M	88	89	90	9,2	8,5	7,3	24,5	27,5	28,2
Dnipro SB 257	78	98	100	14,0	12,3	12,1	12,2	25,0	17,4
RAM 2604	80	82	88	10,6	6,0	14,2	13,5	17,5	23,6
The average in shape	82	90	93	11,3	8,9	11,2	16,7	23,3	23,1
Parental forms of maize									
Berezina C	84	90	96	8,0	9,7	14,3	21,1	22,5	28,7
Daniel simple	86	86	87	11,6	11,7	11,8	19,5	30,8	24,7
The average in shape	85	88	92	9,8	10,7	13,1	20,3	26,7	26,7
3- linear hybrids									
Kremen SB 200	96	96	96	12,5	8,9	14,1	25,0	26,7	29,2
Lyubava 279 MB	95	95	96	13,4	8,5	13,2	26,2	29,4	33,0
The average in shape	96	96	96	13,0	8,7	13,7	25,6	28,1	31,1

What could confirm the implementation of the theoretical position that phenotypic variability is much vuzhe than genetic. Studied the impact of vitamin P on seed germination with minor injuries skins or endosperm (without destruction of the

embryo and cotyledons), the study showed 3-5 times higher germination of seeds treated than in control.

Conclusions and prospects for further research. Studies have shown efficiency of quercetin and rutin as plant growth stimulators, but this effect to some extent depends on the genetic characteristics of plants. In general, routine aglycone - quercetin provides significantly higher impact on germination and seedling length and corn roots than routine. The results of fundamental importance because they can specify not only on growth and development, but also allow relying on theoretical understanding of genetics, to judge the success of the formation of the target plant genotypes and gene pools of lines and hybrids.

It is shown biological activity of bioflavonoids on different maize breeding material. Studies have shown promise for use of bioflavonoids as stimulation and regulation of seed germination in the Pre period. The results are theoretical and practical interest to students and scholars working in the field as a reference source and can be used as inputs for further study the effect of flavonoids on crops.

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