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ГАЛАХИМ



## The agroecological factors influence on diseases development and wheat productivity

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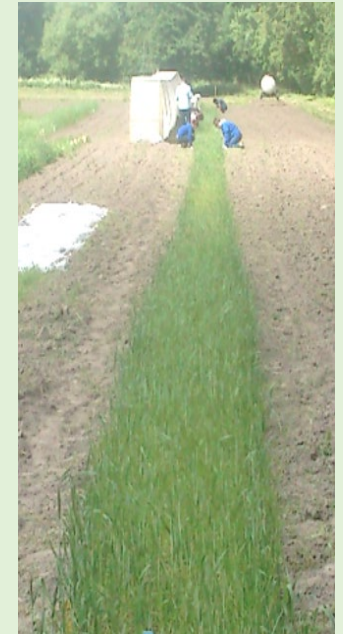
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**Keywords:** soft wheat, wheat diseases, wheat productivity, severity of disease, agroecological factors, organo-mineral fertilizer, protein growth stimulator

**Research Objective:** More than 1400 cultivars provided by the Department of wheat genetic resources of VIR served as the plant material of the study for assessing the long-term dynamics of development and harmfulness of pathogens (2009-2019) on the collection of soft wheat (*Triticum aestivum* L.). In 2019, four samples were used to determine the effectiveness of the organomineral fertilizers influence on wheat productivity and disease resistance: Leningradskaya 6, K-64900, Tulaykovskaya 108, K-65452, Sudarynya, K-66407, Trizo, K-64981. 14 samples were used for biological rationale of the protein growth stimulator application in wheat cultivation: Tyumenskaya 29, K-65247; LP-588-1-06 K-65446 et al. As organo-mineral fertilizer in the experiment was used: «FlorGumat», «EdaGum», «Fitop-Flora-S», «Zerebra agro». The protein growth stimulator was obtained from the by-products of processing of slaughtered animals (cuttings of split char beef) by chemical hydrolysis (RF Patent No. 2533037). Currently, the protein stimulator of plant growth and development is being actively tested on cereals at the megafaculty of biotechnologies and low-temperature systems of ITMO University and at the Department of plant quarantine protection of SPb Agrarian University.



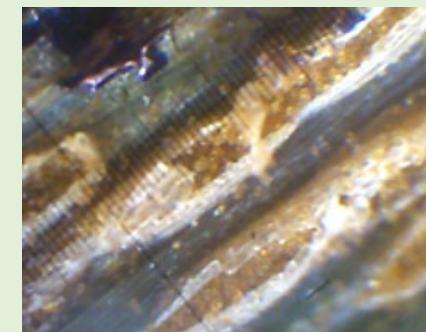
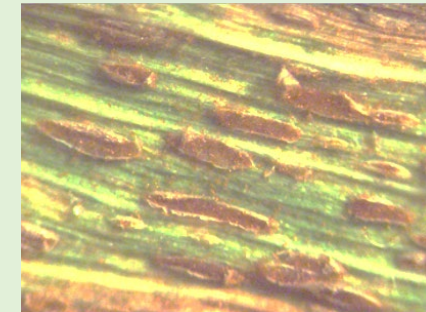
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**Results** A number of relationships between weather conditions of vegetation periods, solar activity and the crops phytosanitary state had been revealed. In particular, the stem and brown rust epiphytotic outbreak in 2010 may be associated with extreme weather conditions of the growing season. The maximum intensity of the brown rust development was revealed in 2014, when the number of detected sunspots had reached the maximum values. The maximum plant damage by stem rust can be associated with a sharp increase in the number of sunspots – by 418.8% in 2010 compared to 2009. The "Zerebra agro " high biological effectiveness against wheat leaf diseases (brown rust, powdery mildew, septoria), and the "FlorGumat" – against wheat root rot was noted. The greatest influence on the potential wheat yield growth was exerted by the preparations "Fitop-Flora-S" and "Zerebra agro". Foliar spraying of plants with the protein growth stimulant (PGS) led to an increase in wheat yield by 31.5% and a decrease in wheat affection by powdery mildew but did not influence on brown rust development. As was revealed by microfocus radiography and optical analysis, after wheat treatments by the PGS, an increase in grains size, their fullness and roundness (compared to the control, without treatment) was observed.



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**Conclusions** The results of this work can be used to develop environmentally friendly technologies for wheat cultivation and optimize the phytosanitary condition of crops. The use of organomineral fertilizers and protein growth stimulator in cultivation in the North-Western region of the Russian Federation is aimed at preserving the potential of biological raw materials, and also involves their integrated use. In addition, reducing the level of wheat diseases is directly related to meeting the needs of the food and feed sectors of the agro-industrial complex. The increase in the yield and quality indicators of wheat grain achieved after processing with the studied preparations allows us to speak about the prospects of their use and the need for further research of the biochemical composition of wheat to determine the range of applications of raw materials with specified properties in various branches of the food industry.

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# *Thank you for your attention!*

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