INTERNATIONAL COOPERATION IN A STRUGGLING AGAINST FUNGAL DISEASE UG99 AS A PROMOTION OF SUSTAINABLE DEVELOPMENT

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The threat of overpopulation of the planet and increasing scarcity of food are the most important problems of human ecology in the twenty-first century. All over the world, a lot of researches are conducted in order to find the ways to promote sustainable development of humanity. It is known that in order to provide that part of the population, energy supply of that lies between life and death (25-30% of humanity), 200 million tons of wheat are sufficient , i.e., approximately 10% of world wheat production. But due to exposure to various pathogens and pests, approximately 250 million tons from the annual harvest are lost, i.e., that portion of the crop dies, which is enough for life support of the poorest groups of world population.

The last few years, scientists in Russia, Europe and the U.S. study the fungal disease Ug99. This is a variety of mold Puccinia graminis (Fig.1).

In scales of the world, 65 million hectares of agricultural lands are now threatened with an epidemic of this disease [1]. Identification of two new species of Ug99, TTKST and TTSSK, which were first discovered in 2006 and 2007 in Kenya, shows the rapid development of the fungus Ug99. Variety TTKST was the cause of a fierce epidemic in 2007 in several regions of Kenya and stroked about half of the wheat varieties, which were know before as resistant to Ug99 [2].

The threat of the spread of Ug99 in most of the countries can be minimized through the rapid identification of disease, manufacture and supply of new high-yielding and disease-resistant grain varieties.

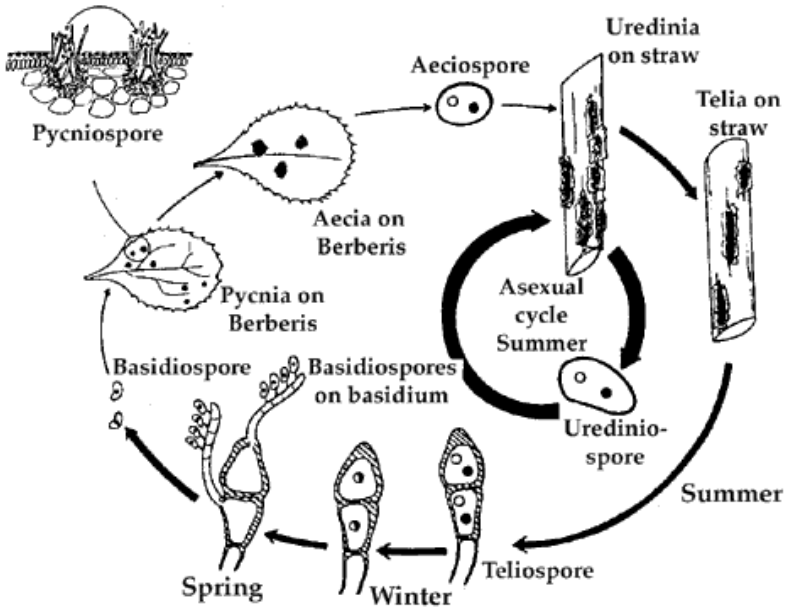

Figure 1. Life Cycle of Puccina graminis

Identification and dissemination of new, resistant to stem rust varieties is the best strategy on the way of their early use in the agricultural sector. This is an achievable goal, as most currently available wheat varieties were bred in the 1990s. Potentially, a possible new harvest of spring wheat germplasm from that time is increased significantly. Testing of new lines of wheat resistant to Ug99 showed that the breeding of new wheat varieties with higher potential yield compared to existing varieties can become a reality. At present great attention is paid to increase the stock of seeds of such wheat varieties. Protection of the world wheat by long-term development of different varieties resistant to Ug99 can not be achieved without the continuation and expansion of the recently initiated joint researches. Traditional breeding, the molecular breeding and other activities that depend on the accurate selection, can not lead to success without international cooperation. Therefore it is necessary to continue work towards decreasing destabilization effects of stem rust disease on the world wheat production and food security. In the next five years it is necessary to create varieties that carry long-term resistance to rust. By 2020, the variety of new sources of long-term sustainability will be identified, and cultivated around the world. Methodology of struggle for the wheat crop is an example of how joint efforts of people from different countries can help to ensure the sustainable production of any agricultural products. Only international cooperation in the fight against pathogens of all crops will allow receiving the harvest, which would be sufficient to provide meal to people in developing countries.

References:

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