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KAZAKHSTAN DANDELION TARAXACUM KOK-SAGHYZ – AN ALTERNATIVE SOURCE OF NATURAL RUBBER (TARAXACUM KOK-SAGHYZ L. E. RODIN)

Abstract. This article contains general information about the natural rubber production in the world and the search for new alternative sources, and about recent studies of the properties of dandelion Taraxacum Kok-Saghyz. The authors present an overview of various methods and technologies for the creation of high-yielding varieties and obtaining natural rubber and sugar from dandelion Taraxacum Kok-Saghyz in the framework of research projects in Europe. This article also contains the biological features and botanical description of dandelion Taraxacum Kok-Saghyz. The expected increase in prices of natural rubber and lack of raw materials in the coming years have convinced of the need for urgent revival of the production of natural rubber from Kok-Saghyz in Kazakhstan, which has all the necessary prerequisites. For sowing in Kazakhstan, KeyGene AgroBusiness Park has provided special varieties of Taraxacum Kok-Saghyz with properties that allow getting from 0.7 ton to 1 ton of latex from 1 ha of crops.
Keywords: natural rubber, dandelion Taraxacum Kok-Saghyz, research, production of rubber.

Introduction. Natural rubber (NR) is a raw material that is widely used in the manufacturing industry, medicine, transportation, aviation, defense, and at home. Nowadays, the main source of natural rubber in the world is the rubber tree Hevea (Hevea brasiliensis), which grows in industrial plantations of South East Asia. The quality of NR is significantly high in comparison with the synthetic substitute, and it is indispensable in tire production. Technology of cultivation of NR sources is friendly to the environment and safe for humans. Obtaining of NR from Hevea relies on heavy manual labor, which cannot be mechanized due to the nature of the tree, while processing and extracting of NR Kok Saghyz can be readily automated.

One of the objective of the Concept of Innovative Development of the Republic of Kazakhstan by 2020, approved by the Decree of the President of the Republic of Kazakhstan dated June 4, 2013 № 579 is "The use of the raw materials potential of the country for expansion of cooperation with foreign investors and companies on attracting advanced technologies and creation of high-tech industries". The development of national innovation is expected to make the most decisive contribution to the development of Kazakhstan.

The solution of many problems of Kazakhstan's economy could be the production of NR in Kazakhstan from its own endemic, listed in the Red Book of Kazakhstan, dandelion Taraxacum Kok Saghyz. Modern studies show that within 5-6 years from the first crop of high-grade seeds of Taraxacum Kok Saghyz on an area of 50 hectares followed by gradual increase to 50 thousand hectares, Kazakhstan could meet the needs of the internal market in natural rubber and within the following 2-3 years could enter the world markets with their domestic products. This process is not easy, requiring internal and external investments, not only in terms of funding but also in terms of knowledge and experience. Nevertheless, this process is quite reliable and promising.

Evaluation of the world production of natural rubber. According to the forecasts of the International group for the study of the rubber market, IRSG (International Rubber Study Group) [1], in the next 10 years, the growth in demand for natural rubber will be 3.7% per year, reaching 15.4 million tons by 2020. China will remain being the main consumer, with projected cumulative annual growth rate for natural rubber consumption of 6.1%.

Analysis of the price for natural rubber on the Tokyo Stock Exchange for July 2016 (Figure 1) shows a steady growth. The sale volume of NR on the Tokyo Stock Exchange since 2012 remains consistently low and continues to decline due to the decrease in the number of delivered natural rubber in Southeast Asia (Figure 2). This did not change in the first half of 2016. The short increase in sales volumes of natural rubber in the world markets in March and April to July 2016 has decreased significantly, which made inevitable impact on the growth of prices for one ton of natural rubber, mostly supplied from South East Asia (Figure 3).

According to the Association of Natural Rubber producing countries (Southeast Asia) [1], accounting for 92% of the total world production of natural rubber from Hevea Brasiliensis, the deficit of global rubber supply may persist until 2018. In addition, with the emergence of new dangerous diseases and pests, adverse climate changes, limited land resources, impossibility to mechanize the process of collecting and extraction of rubber, high human factor, long period of trees' maturing (6-8 years), etc., it is unlikely that the region and the main source of obtaining natural rubber from Hevea will be able to provide the world needs in natural rubber. In addition, the three largest producers of natural rubber – Thailand, Indonesia and Malaysia, whose combined share accounts for up to 70% of the world production of this material, plan to cut down old trees on the area of 100 000 hectares. According to the International Council of the tripartite rubber (ITRC), this will reduce the market supply to 450 000 tons per year.

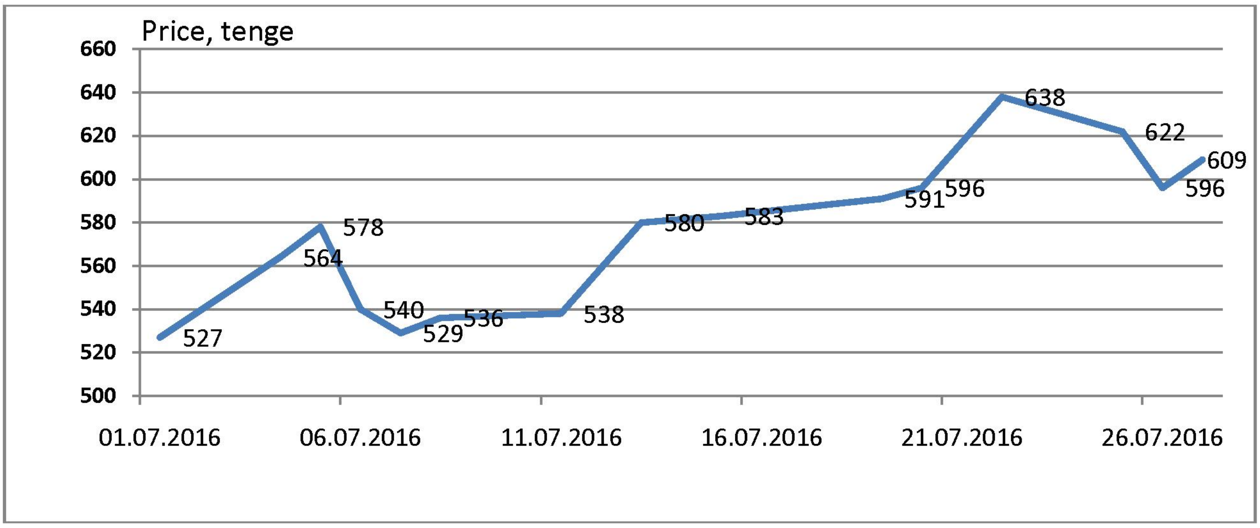

Figure 1 – Diagram of rising prices for natural rubber on the Tokyo Stock Exchange for July 2016

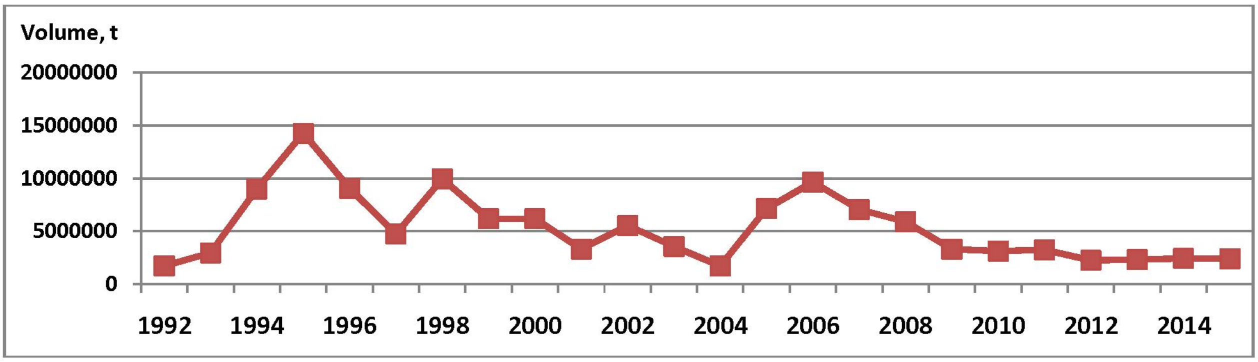

Figure 2 – The volume of worldwide sales of natural rubber according to the Tokyo Stock Exchange for 1992-2015