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### **ЫСЫК-КӨЛ ОБЛАСТЫНЫН АГРОТУРИЗМИ - ЖАҢЫ ӨСҮМДҮКТӨРҮН ӨСТҮРҮҮ**

Макалада автордун жаңы жер жемишин өстүрүүдөгү эксперименти жана реалдуу тажрыйбага негизделген тыянактары менен сунуштары камтылат. Ошондой эле эксперименталдык иштин биринчи жылынын арадагы жана акыркы жыйынтыгын баяндайт.

**Негизги сөздөр:** табигый дыйканчылык, адам капиталы, агро-туризм, жакырлар шартындагы туризм, акыркы заманбап байланышы, диффузия.

### **АГРОТУРИЗМ В ИССЫК-КУЛЬСКОЙ ОБЛАСТИ - ВЫРАЩИВАНИЕ НОВЫХ КУЛЬТУР**

Статья содержит авторские разработки идеи, выводы и рекомендации, построенные на основе экспериментов и реального опыта по выращиванию новой культуры-брюква. Также излагаются промежуточные, окончательные результаты первого года экспериментальной деятельности.

**Ключевые слова:** крестьяне, ведущее натуральное хозяйство, человеческий капитал, агротуризм и туризм для улучшения положения малоимущих, современные коммуникации, диффузия.

### **AGRO-TOURISM IN THE ISSYK-KUL REGION - THE CULTIVATION OF NEW CROPS**

This article includes the author's developed idea, conclusions and recommendations, based on the experiments and real experience in growing the new vegetable Rutabaga in the Issyk-Kul Region of the Kyrgyz Republic. It also describes the interim and final results of the first-year experimental activities.

**Key words:** subsistence farming, human capital, Agritourism and propoor tourism, modern communications, diffusion. Fodder crop, table variety

#### **Foreword**

The idea of introducing the new culture Rutabaga in the Kyrgyz Republic is in response to the FAO survey results presented during the seminar: "The Rights to Food", organized by the

NGO “Innovative Solution”, which was held on December 4 2015<sup>1</sup> in Bishkek, Kyrgyz Republic. The survey data stated the fact there is a high rate of anemia among citizens of the Kyrgyz Republic. Growing Rutabaga will improve the healthy eating habits and could help eliminate the deficiency diseases.

Our goal of introducing this vegetable and its process of growing for scientific purpose is one of the best solutions to help citizens improve their quality of nutrition, mitigate the level of anemia and level of health education. Particularly, for farmers, dealing with subsistence farming, i.e., farming that provides enough food for the farmer and their family to live on, but not enough for them to sell in the Kyrgyz Republic.

As we know, in the past the former larger farms like ”sovkhoz” and “kolkhoz” lands are divided into smaller households. At that time professionals provided special services for both farms” sovkhoz and kolkhoz. Today we turn our attention to the fact that peasant farmers grow most of produce sold in local market in the Kyrgyz Republic. 96% of agricultural products in Kyrgyzstan are produced in 400 thousand small farms with 3 hectares of land each. This is stated in the concept of food security and nutrition, developed by international organizations of WFP, UNCEF, WHO.

According to the information, despite the important role of small farmers, their marketing opportunities are limited. Inadequate development of the food system and key value chains leads to the exclusion of the majority of small farmers from the market. This leads to high losses after harvest.<sup>2</sup>

Kyrgyz government approved food standards for Kyrgyz citizens in 2009. According to the document, each resident of the country must eat 9 items of food every month.

The approved standard includes bread products - 9 kilograms, meat - 5 kilograms, potatoes - 8.2 kilograms, vegetables - 9 kilograms, fruits and berries - 10 kilograms, sugar - 2 kilograms, milk - 17 liters, vegetable oil - 1 liter, eggs - 4 pieces, fish and fish products - 100 grams, tea - 200 grams. Based on the minimum norm set by the state, we calculated the cost of a consumer basket of a family of four. We took the price of food in one of the supermarkets in Bishkek as a basis. Many residents of the city in recent times are increasingly purchased in large stores.

Thus, each Kyrgyz citizen should consume per week:

Products	Quantity
Bread and macaroni products	2kg
Meat	1.1kg
Potatoes	1,8kg
Vegetables	2kg
Fruits and berries	2,2kg
Sugar	440gr
Milk	4lit.
Eggs	4 pieces
Fish	25gr
Oil	200gr

<sup>1</sup> “Evaluation of the Right to Food in the Kyrgyz Republic” Survey results presented by FAO on December 4, 2015

<sup>2</sup> Kabar. - Bishkek, 11/23/18. Elena Tsoi

There is “The World Bank study<sup>3</sup> on Kyrgyzstan Comprehensive Diagnostics of the Country for 2018 analyzes the trends and factors of the economic growth of the Kyrgyz Republic in the past, and also determines measures for further poverty reduction and ensuring well-being for all. Over the past 20 years, economic activity in the Kyrgyz Republic had based mainly on gold mining, export of labor migrants, import and re-export of goods in large bazaars.

As we know, the World Bank’s latest research shows that it is very important in all countries to develop human capital, improving the quality of health care and education.

As for the long-term growth, the main hope is the private sector, which must «get out of the shadows» and create high quality and sustainable jobs.

To do this, first of all, it is necessary to ensure compliance with the law and improve the business climate. This will attract investment in the most promising sectors — agriculture, tourism, mining and hydropower”.

For the first time, the idea to grow Rutabaga implemented in Issyk-Kul and Chui regions between May and June 2018 was due to the research data results done by FAO. There is no easy solution to deficiency diseases in Kyrgyzstan. In modern days, more and more people are moving towards vegetarianism in the country.

To develop idea further, the students from the Academy of Innovations named by Professor, Sh. Musakozhoev’s delivered the new table variety of Rutabaga seeds, called "Viele” from Norway into Kyrgyzstan at their own expense. Students explained the nutritional value to help peasants in the Kyrgyz Republic to improve their nutrition. Growing Rutabaga is a promising root crop with its nutritional and dietary qualities as one of the best solutions to anemia and chronic malnutrition in terms of its affordability, accessibility, availability and food safety in the country. From January to April, students negotiated and consulted with the agronomist on growing Rutabaga in Norway. In May and June 2018, students made their first round trip to target communities to deliver the information, consultation on introducing the new culture - rutabaga in Issyk-Kul region. Elite seeds of table Rutabaga, a very promising root crop, were offered to farmers in this area for their nutritional and dietary qualities, in addition to common crops such as carrots, red beet, and radish. Information on the basic requirements for planting and growing a table variety of Rutabaga was provided. Farmers received basic information on planting Rutabaga, as well as a list of foods and a set of instructions telling them how to cook the crop. Afterwards, farmers were provided with seeds, and they followed all the rules when planting. The seeds were planted immediately in an open ground on May 20, 21 in Issyk-Kul and June 9, 2018 in Chui regions.

Iron deficiency anemia (IDA) is a national problem of the health systems of different countries. Whereas in the countries of Western Europe and the USA, issues related to Fe deficiency are largely solved due to the implementation of the World Health Organization (WHO) and

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<sup>3</sup> On 20 October 2018, Bishkek - 24.kg news agency, by Julia KOSTENKO The International Day for the Eradication of Poverty marked this week. Bolormaa Amgaabazar, the head of the World Bank’s office in Kyrgyzstan, believes that the eradication of poverty is a moral duty of mankind. She told **24.kg news agency** what results the republic has achieved and what kind of assistance the World Bank provides.

Hemoglobin Recovery Program Iron deficiency (IDA). The deficiency of Fe remains a serious medical and social problem in Kyrgyzstan. As known, severity of anemia according to A.Mitery: light degree: hemoglobin 120-90g/l; moderate: hemoglobin 90-70g/l and heavy: Hemoglobin is less than 70g/l. Studies have noted a decrease in electrical activity in the hemispheres and occipital lobes of the brain. Some authors have associated with a deficiency of iron cause thinking disorders, reduced cognitive functions and memory, as well as the development of Parkinson's and Alzheimer's disease. Changes in the nervous system can cause fatigue, tinnitus, dizziness, headaches, decreased intellectual ability<sup>4</sup>. One of the reasons why in Kyrgyzstan parents are complaining of serious deficiencies in the educational system might be IDA.

Health utility of Rutabaga.

There is vitamin C, P, B1 and B2 in Rutabaga, as well as minerals – iron, calcium, sodium, potassium, phosphorus. The vegetable Rutabaga contains about 10% sugar, a lot of fiber, starch, proteins, a small amount of oils. There are 37 calories in Rutabaga. Nutritional value of Rutabaga: proteins - 1,2 g, fats-0,1 g, carbohydrates -7,7 g. According to the nutritionists and gastronomes, Rutabaga even surpasses the well-known turnip in taste and nutritional qualities. As early as the 13<sup>th</sup>-19<sup>th</sup> centuries in Russia, the table variety of turnip was the same natural vegetable crop in vegetable gardens and as nutrition as carrots or beets. In the kitchens of Scandinavia and the UK, mashed Rutabaga, carrots, potatoes and sometimes onions, which served with milk, cream or butter, are popular. In Canada, Rutabaga is used as a filling for holiday cakes. However, for quite uncertain reasons, Rutabaga disappeared from the diet of people, and the word itself lost somewhere in the explanatory dictionaries. Ask your friends and acquaintances what Rutabaga is and most of them just shrug their shoulders. In modern days, Rutabaga is mainly grown by a large-scale agricultural farms as fodder crops, an animal food (**that is given to cows, horses, and other farm animals**), but table varieties also remain in developed countries. This culture belongs to the cruciferous family crops. It is a biennial.



leaves and an oblate-spherical root with white or yellowish flesh. In the second, it throws out a flowering stem up to 1.5 m in height with umbrella heads made from yellow or orange small flowers.

Rutabaga pods and seeds. Seeds are small, round, dark brown color. In the year of sowing, Rutabaga forms a rosette of large lyre-leaves and an oblate-spherical root with white or yellowish flesh. In the second year, it throws out flowering stem up to, 1,5m in height with umbrella heads made from yellow or orange small flowers. In the year of sowing, rutabaga forms a rosette of large lyre



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<sup>4</sup> Internet open source



soil.



Increased cold resistance characterizes the plant, so it is suitable for growing in the northern regions of our country. Seeds germinate at 2-3° C, and young plants withstand frosts to – 3° C, and adults – to 5° C. The optimum temperature for growing is 16–18° C. Rutabaga is very moisture-loving plant. In the hot summer, with a low humidity of the air and soil, the roots do not grow to their natural size and lose their juiciness. Rutabaga does not tolerate the acid

Our work involves reproducing and recreating the new variety of an old table Rutabaga in Kyrgyzstan. There are no other zoned varieties yet available. The Rutabaga is medium early variety (90-112 days), has a mass of root crops up to 800 g. It has a good safe life quality, excellent taste, sugary intense yellowish flesh, high yield and resistance to stemming or stem extension stage.

The best precursors are potatoes, cucumbers, tomatoes and legumes. Rutabaga grown by direct sowing of seeds in the ground and by seedling. It loves fertile soil and responds to organic well.

Sowing plan in early spring, in April-May and the vegetation period is 110-130 days.

The care of Rutabaga is similar to root crops: watering, weeding, and loosening the row spacing. Rutabaga diseases include club root diseases stem blight and bacterial soft rot. Cruciferous flea and cabbage fly often affects it. However, our Rutabaga roots have grown healthy due to excellent care.

Planting techniques:

Sowing single line, 25-30 cm between rows, and 20-25 cm between plants. Seeding depth is 2-2,5 cm. Farmers recommend that sowing single line, 35-40 cm between rows, and 35-40 cm between plants. Seeding depth is 1,5-2 cm

When the roots reach an acceptable size, they are eaten during the season. Ripened root vegetables can reach a weight of 0.5 kg. We carried out the subsistence harvesting in late September 2018 in Issyl-Kul, but failed to collect any in Chui. Root vegetables are carefully dug, trying not to damage, dried in the sun, cut the leaves at a height of 2-3 cm and lay in storage in the basement in boxes, laying in rows. Farmers recommend that the subsistence harvesting must carried out in late September in dry weather.

Rutabaga uses: (food and medical) it is used for food mixed with meat and cooked fresh and processed form. Pulp is used in salads and soups, stewed, steamed, fired and baked. Young leaves of Rutabaga are added in small quantities to salads as spicy greens. Medicinal qualities of Rutabaga assumes its widespread use in clinical nutrition. Mashed and squeezed pulp of Rutabaga has been successfully used in folk medicine for wound healing, antburn, diuretic and carminative agent.

An Infusion of Rutabaga.

An infusion of Rutabaga seeds rinsed out the mouth and throat for inflammation and successfully cured measles in children.

Infusion made by Rutabaga seeds: A drink made by 1 tsp. seeds leaving in a glass of hot (boiled) water and steep 25-30 minutes; drink 3/4 cup 3-4 times a day.

It is important to understand that Rutabaga is contraindicated in diseases of the inflammatory nature of the digestive system and the gastrointestinal tract.

SALAD from Rutabaga: peeled raw Rutabaga, grate on a coarse grater, add chopped green or onions, boiled egg, salt and dress with mayonnaise or sour cream.

Soup from Rutabagas: put rutabaga and sliced potatoes into meat or chicken broth; cook until tender (softening); before serving fill the sour cream.

ROASTED rutabaga: cut the root crop into wide slices about 1 cm thick, add salt, pepper, roll in breadcrumbs or flour; fry vegetable in an oil or butter until golden brown and bring to readiness in an oven or microwave; sprinkle with chopped parsley and / or dill before serving, sprinkle with sour cream.

## **CONCLUSION**

In conclusion, farmers are reporting a good harvest this year in Issyk-Kul. Students demonstrated taste sampling with the Academy staff and group students. However, what if plants do not take root, despite the observance of all the planting rules? (Please see the photo below in community Sarban, Chiu region). We still need a specialized education to determine the best planting worthy solutions. In our eagerness to find a solution how to stop anemia, we have overlooked certain difficulties, such as the study the composition of the soil.

Rutabaga is useful for not only established, accomplished landowners and farmers, but also for peasant farmers, as well as for those, who are just casual farming that provides enough food for their family to live on, but not enough for them to sell. In order to produce Rutabaga and obtain the high-quality seeds from the soils of subsistence farming and peasant farming in Kyrgyzstan, students need to perform analysis.

It allows students to evaluate the fertility of the soil and to take steps to improve it. Students have not discussed the matter yet in details with the university skilled experts and we could review the example of laboratory of at the Hochschule Weihenstephan –Triesdorf in Germany. We are eager to learn how microbiological research is conducted at this University. Because this type of analysis reveals the number of microorganisms that inhabit in the soil – bacteria, fungi, soil algae, protozoa. Students are looking forward to cooperation on studying the biological activity of the soil and the presence of pathogenic microroganisms that cause various diseases (Escherichia coli, tapeworm, salmonella etc.) need to learn more about the study in terms of agricultural fertilizers (herbicides, insecticides). The pesticides, peasants spray on their crops kill pests, but they also may damage people's health, which also harm the condition of the soil, leading to its depletion and toxic contamination. When is it necessary to analyze the soil and how is it done; how is a toxicological assessment performed to identify soil contamination by harmful substances. Agrochemical study of the soil allows its fertility level; what is included in the study?

Based on these facts, the production of such a plant, which is organized, corresponds to the identified deficiency disease and future demand. In addition, a system of measurement to influence the market, the formation of consumer demand in the most profitable directions for our study needs to be developed.

As we know, the conceptual basis of a market economy is consistently made up of the concept of: production (orientation with regard to the production of relatively cheap goods or services);

marketing (the main efforts of business activity focus on the sale of goods and services). Marketing concept (the basis of any market activity is first of all, the needs, tastes, preferences, consumer demand); the concept of ethical marketing (not all needs are absolutely satisfied, but those of them that form the school of human values contribute to the harmonious development of society and the individual).

What Kyrgyzstan needs is a long-term policy for investment in science and technology. People on low income should be able to live in a society and economically, budgeting and saving money in an integrated environment. Kyrgyzstan has no need to import a large number of fruits and vegetables from different countries. Kyrgyzstan needs to develop a model that offers an opportunity for a more integrated approach to health care. Our fruits and vegetables sell so well in our country that we have no need to export, but to produce a product that is designed for the mass market, i.e. is intended to be bought by as many people as possible, not just by people with a lot of money or a special interest. Advances in import have made all the different types of fruits like orange, tangerine, etc. affordable to the mass market. Rutabaga is the best option for peasant farmers and people, lacking of iron in their diet, taking into account the needs of anemic customers and the conditions of our climate.

Below presented time schedule and photos of the first year progresses and fail.

	<b>January / Februar y 2018</b>	<b>March /April 2018</b>	<b>May /June 2018</b>	<b>July/A ugust/ 2018</b>	<b>Septem ber/No vember</b>	<b>Dec 2018</b>
1. the generated idea (who needs Rutabaga, why to grow Rutabaga and what needs to fulfill)	√	√	√	√		
1.1 Negotiations with the agronomist and the experts	√	√				
1.2 Ordering and delivering the elite seeds of Rutabaga		√				
1.3 Round trip to Issyk-Kul		√	√			
1.4 Delivering consulting and Info-trainings on Rutabaga growing			√			
1.5 Seeds Planting and Monitoring the progress				√		
1.6 First Harvest collection, reporting from farmers and storing					√	
1.7 Taste demonstration and sharing the info					√	
1.8. Looking for collaboration with Universities	√	√	√	√	√	√



<b>2. real performance (quality, utility, design, brand, packaging)</b>						
<b>3. simplification (the ability to reduce the price by reducing the set of properties)</b>						
<b>4. underpinning (assessment of reliability, service life, competence, services, competitiveness)</b>						

Photos during the work with farmers.



Taste sampling of Rutabaga, delivered from Norway for locals.  
Распределение семенного посадочного материала брюквы







**Community Tamga.**

**Community Sarban**







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