

HELIANTHUS TUBEROSUS L. – PERSPECTIVE CULTURE IN UZBEKISTAN

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Abstract: this article presents the results of phenological observations of the growth and development of Jerusalem artichoke in the soil and climatic conditions of the Republic of Uzbekistan. The results of our research in recent years have revealed great potential for culture. Jerusalem artichoke is a valuable fodder, food, technical and medicinal culture. When cultivating Jerusalem artichoke in the southern regions, besides a large crop of aboveground mass, a large harvest of tubers is obtained. In the northern regions, however, there is a significant decrease in the yield of tubers, and in some cases they are not formed at all. In addition, information is provided on the practical application of this plant.

Keywords: Jerusalem artichoke, growth, development, productivity, biomeliorant, fodder, food, medicinal and ornamental plant.

HELIANTHUS TUBEROSUS L. – ПЕРСПЕКТИВНАЯ КУЛЬТУРА В УЗБЕКИСТАНЕ

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Аннотация: в данной статье приведены результаты фенологических наблюдений роста и развития топинамбура в почвенно-климатических условиях Республики Узбекистан. Результаты проведенных нами за последние годы исследований выявили большие потенциальные возможности культуры. Топинамбур является ценной кормовой, пищевой, технической и лекарственной культурой. При возделывании топинамбура в южных районах кроме большого урожая надземной массы получается и большой урожай клубней. В северных же районах происходит существенное уменьшение урожая клубней, а в некоторых случаях они вовсе не образуются. Кроме того приведена информация о практическом применении данного растения.

Ключевые слова: топинамбур, рост, развитие, продуктивность, биомелиорант, кормовое, пищевое, лекарственное и декоративное растение.

UDC 633.494:581.522.4

The study and introduction into the culture of new and promising plants, the productivity and nutritional value of which is not inferior or even exceeds the traditional species, acquires an important role in the conditions of our republic where the irrigated soils are salinized to a different degree, are subject to deflation, a strong trend towards desertification, etc.

At present, one of the most promising forage crops - Jerusalem artichoke - is widely promoted to introduce and introduce into agricultural practice. Thanks to the unique biochemical composition and depending on the conditions of cultivation in many countries Jerusalem artichoke is widely used for food, fodder, technical, medical and dietary purposes.

Jerusalem artichoke is known to farmers for thousands of years. His homeland is considered North America [5]. In Europe, this vegetable culture was introduced in the XVII century simultaneously with the Indians of the Tupinambas tribe. Hence the strange name of the vegetable is Jerusalem artichoke [1]. In the tubers of the plant there is a lot of potassium, zinc, iron (the earth's pear significantly surpasses potatoes, beets, carrots according to iron content). In addition, Jerusalem artichoke contains proteins, sugars, various amino acids, as well as carbohydrates, the main of which is inulin. From tubers it is possible to receive as inulin, and alcohol, biogas and other products of medical and technical purpose. Jerusalem artichoke is able to grow without re-planting in one place for a long time (8-10 years or more), is not susceptible to disease, requires minimal care, is drought-

resistant. Jerusalem artichoke can grow on all types of soil, with the exception of salt marshes and swampy soils, and also does not tolerate acid soils. The best for it are loamy and sandy loam soils [3].

And although Jerusalem artichoke is widely spread in the world and has long proved its economic effectiveness, in our country, despite its huge potential, this culture is still unconventional.

Jerusalem artichoke or earth pear (*Helianthus tuberosus* L. - tuberous sunflower) is a perennial herbaceous plant of the Asteraceae family. The biological potential of the crop is opened with sufficient heat supply during the vegetation period with the sum of positive temperatures, depending on the early ripeness of variety 2700-3600°C.

In the wild, Jerusalem artichoke is growing in North America, where it was introduced to the Indians in culture even before the arrival of Europeans. In Europe (France, England) was introduced at the beginning of the XVII century, and from the second half of the XIX century widely spread as a food and fodder culture. They cultivate in the USA, France, Great Britain, Sweden, Norway [2].

In Uzbekistan, Jerusalem artichoke is a new and little-studied culture, especially taking into account the diversity of soil and climate conditions. In this connection, the aim of this work was to study the bioecological features of Jerusalem artichoke in the conditions of introduction and to find rational ways of its use. Jerusalem artichoke was grown in the Botanical Garden of the National University of Uzbekistan and in the experimental sections of the Karakalpak State University.

Listostebelnye organs and roots die each year, and tubers, overwintering in the ground, are preserved and if they are not removed from the soil, then in spring they will shoot. Jerusalem artichoke has erect, branching, well-leafy green or slightly violet stems with a height of 1.5 to 4 m. The bushiness is from 1 to 5 stems per plant. The number of stems depends on the size of the tuber, and also on the variety.

Leaves ovate, elongate-ovoid, pointed, large, serrate along the edges. The degree of serration of the edge of the leaf depends on the age of the leaf and the variety. The arrangement of the leaves is usually mixed - in the germination phase they look like rosettes, and the budding phase - in the lower part of the shoot opposite, in the middle and upper - the next.

The flowers of Jerusalem artichoke are collected in groups of 50-60 pieces. In the inflorescence - baskets with a diameter of 1.3-5 cm. Inflorescences are located on the tops of the main and lateral shoots. The number of inflorescences on the plant varies widely, depending on the variety and on the development power of the plants (5-50 pieces per plant). Jerusalem artichoke belongs to cross-pollinating plants and is a good honey. As a result of pollination, small fruits are formed.

Fruit - seed, in form similar to sunflower seed, but much less than it. The mass of 1000 achenes is 7-9 g. Achenes only mature in areas of hot climate.

The root system is fibrous, well branched. The depth of root penetration is up to 2 m. Stones are formed in the underground part of the shoot. The upper internodes of the stolon thicken and turn into a tuber. The length of stolons depends on the variety, but also varies greatly under the influence of various soil and climatic factors.

Tubers - pear-shaped, oblong-oval or clavate with a smooth or tuberous surface. Young tubers usually have a round or elongated shape, the larger the tubers, the more irregular they usually are. On one plant is formed from 10 to 20 tubers the size of an average potato. In contrast to potato tubers, Jerusalem artichoke tubers do not have a cork layer (periderm), so they are poorly stored and their peel is removed in the spring. The coloration of the peel of the tuber can be yellow, pink or reddish-violet, the pulp of the tuber is white, loose.

Plants carry an increased content of oxides of sulfur, nitrogen, hydrogen sulfide, ammonia and other gases and clean the air of them well.

Jerusalem artichoke reacts well to improved nutrition conditions - fertilizers and irrigation significantly increase productivity. It is demanding of moisture and more resistant to excessive moisture than to its lack. It carries arid periods, since it has a powerful root system.

Jerusalem artichoke is a biomeliorant, contributes to the cultivation of soils, while protecting against wind and water erosion. This is an excellent recultivator and it is planted on lands withdrawn from agricultural circulation, after 3-5 years of cultivation of Jerusalem artichoke soil regenerates its fertility.

When cultivating Jerusalem artichoke in the southern regions, besides a large crop of aboveground mass, a large harvest of tubers is obtained. In the northern regions, however, there is a significant decrease in the yield of tubers, and in some cases they are not formed at all. In addition to the thermal regime and soil conditions, the light regime also influences such a change in the ratio of yields of tubers and stems. The long day of the northern regions stretches the duration of the individual phases of development of Jerusalem artichoke.

Jerusalem artichoke is a plant of universal use and has no restrictions in use. Depending on the conditions of cultivation and specific features in many countries, it is widely used as a fodder, food, medicinal and ornamental plant. The green mass is well eaten by all animals. Nutrition is 100 kg. The green mass of Jerusalem artichoke is on the average 22-26 fodder units. Prepared high-quality herbal flour and silage from the green mass of Jerusalem artichoke. The combination of a crop of tubers and a green mass increases the fodder value of Jerusalem artichoke [6].

It is necessary to briefly dwell on the medicinal properties of Jerusalem artichoke. At present, the useful properties of Jerusalem artichoke are used only for some medical purposes. Jerusalem artichoke has a wide range of therapeutic actions: immunostimulating, soothing, restorative, tonic, atherosclerotic, anti-inflammatory, restorative, sugar-reducing, laxative.

Oil artichoke stabilizes blood sugar and cholesterol, as well as metabolism, removes radionuclides (slag, toxins), promotes tissue regeneration and normalizes the intestinal microflora is a nutrient substrate and a construction material for the intestinal epithelium and increases immunity and hemoglobin, increases the absorption of calcium and magnesium ions, which is important to prevent osteoporosis, reduce appetite and thus contributes to the rapid saturation of the organism with food.

Infusions and decoctions artichoke laxative effect, eliminate constipation, abdominal pain, and reduce wrinkles. Jerusalem artichoke effectively satisfies the need for carbohydrates and does not increase the level of glucose in the blood and stimulates the production of insulin, prevents obesity, and deposition of salts, neutralizes toxins and heavy metals, which is especially important for people cities and also provides effective impact on iron deficiency anemia of various severity.

For example, Jerusalem artichoke tubers and products from it (powder, decoctions, infusions, syrups) are used in the diets of patients with type 1 and type 2 diabetes and obesity. Of particular value is the Jerusalem artichoke syrup as an inulin-containing biologically active nutritional component and a sugar substitute for diabetic patients, because when it is taken, blood sugar levels stabilize and the need for insulin preparations naturally decreases. Syrup as an immunostimulating product is recommended to people of mental and physical labor to improve the working capacity and vitality of the body, as well as in an unfavorable ecological environment [3].

Thus, Jerusalem artichoke as a highly productive, resistant to adverse environmental factors (adapts well to any climatic conditions, is resistant to pests and diseases) and unpretentious plant can take a worthy place in agricultural production and medical industry.

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