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## THE THURINGIAN MALLOW (*LAVATERA THURINGIACA* L.) AND ITS UNIQUE PROPERTIES

Recently, there has been an increasing demand for new non-traditional high-yielding plants that can compete with existing common crops. After all, many of them significantly exceed the existing generally recognized fodder and vegetable crops in terms of stability and economic value indicators.

Among the new fodder and vegetable crops, many species have been introduced. Species of the mallow family *Malvaceae*, which belong to technical, vegetable, flower garden, decorative and medicinal plants, deserve attention.

In the first half of the 20th century, a lot of work was carried out on the introduction of valuable plants of various uses. Their properties have been studied, and the possibility of using individual species of this family in production has been proven.

*Lavatera thuringiaca* L. is a rather valuable perennial herbaceous plant from the mallow family. Its pharmacological properties are close to those of altea [1].

For medical purpose leaves of *Lavatera*, collected during the flowering period of the plant as well as roots collected in autumn are used. Thuringian Mallow has enveloping and anti-inflammatory properties. Folk medicine recommends taking a decoction of the roots internally for colds, coughs, hoarseness of the voice. Decoction of *Lavatera* is effective in the presence of diarrhea and other gastrointestinal diseases. The cold infusion of the roots of Thuringian khatma is advisable to use also in medical cosmetics. It is an anti-inflammatory agent for seborrheic dermatitis of the face and inflamed acne [2].

There are investigations proving that Thuringian mallow contains components which has a certain antibacterial effect [6] and that the species may be used as a potential source of biologically compounds [7].

Ointment made from dry leaves of the plant can be rubbed for rheumatic and neuralgic pains. Boils, ulcers, ringworm, pustular lesions of the skin can be eliminated by applying fresh crushed leaves of *lavatera*.

However, it should be noted that the chemical composition of khatma requires a thorough study. It is only known that the roots contain a significant amount of mucous substances, and the leaves contain ascorbic acid (up to 205.9 mg%).

*Lavatera thuringiaca* is pointed as a plant suitable for a multi-purpose cultivation, i.a as: source of high-performance energy biomass (15-25 t d.w. ha<sup>-1</sup>), with a chemical composition similar to woody plants, species to be sown on roadsides and useful in recultivation of degraded lands, raw material for the pulp and

paper industry or as supplement for plant feed for ruminants, due to the high content of digestible protein and sugars in the forage [8].

However, authors of the mentioned paper pointed that a very low seed germination makes commercial production of these plants difficult and reduces the economic efficiency of crops.

Using the method of multi-year selection, scientists Yu.A. Uteush, D.B. Rakhmetov created many varieties of different types of plants. At the same time, the most widely used is only one variety of Thuringian khatma - Stugna-1. It is classified as high-protein, plastic, winter- and drought-resistant cultures Thuringian ryegrass can be kept in one place outside of crop rotation for up to 10 years. The linear growth of plants reaches a height of 150-220 cm [3].

*Lavatera* requires nutrients in the soil. In order to form a high yield, it is recommended to feed the plants with nitrogen N45-60 combined with loosening the rows. Even after harvesting for seeds, the Thuringian mallow manages to grow up to 50-60 cm of height and reaches the phase of budding – the beginning of flowering [4].

Thuringian *Lavatera* is a fairly tall plant, so it is planted in single plantings. Landscape design quite often involves the use of compact bushes to decorate borders, plantings along paths or fences. *Lavatera thuringiaca* is often placed near a gazebo or garden bench.

In addition, owners often make wonderful flower arrangements with *Lavatera Thuringia*, because it goes well with many flowers of medium height.

In order to increase the productivity of seed crops, it is effective to carry out additional artificial pollination, made two to three times with an interval of two to three days. This method contributes to an increase the harvest by 10-15%. For this purpose, apiaries with bees are placed on the field during the flowering period [5].

The knowledge of *Lavatera thuringiaca* and its potential is still insufficient. Thus, further research on the unique properties of that species should be continued.

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## **ENVIRONMENTAL CLIMATE CHANGE AND ROLE OF LIQUID FERTILIZERS IN INCREASING WHEAT YIELDS IN THE ARID ZONE**

The potential yield of currently grown wheat varieties meets the needs of farmers, but it is difficult to achieve it without the use of modern technologies and fertilizers. It is necessary to create conditions for increasing the potential of high-yielding varieties, for which it is necessary to use new fertilizers and modern technologies.

In 2016–2021, in order to obtain a high yield of wheat crop on the test fields of the scientific research center, we tested and studied promising liquid organic fertilizers Ecorost, GSN-2004 and CAS 32.

The fertilizer “Escorost” is of natural origin and contains microorganisms, due to which complex biochemical reactions occur in the soil. It includes all the substances necessary for living organisms: amino acids, mono- and polysaccharides, peptides, vitamins, mineral components, etc. Its use increases the drought resistance of the plant, frost resistance, immunity to diseases and pests.

Fertilizer KAS-32 contains 28–32% nitrogen. Nitrogen in it is present in three forms: nitrate NO<sub>3</sub>, fast-acting and easily moving in the soil, its content is 8%; Ammonium NH<sub>4</sub>, which is effectively used by plants for a long time due to adsorption by soil particles. Its content is also 8%; Amide NH<sub>2</sub>, this form is not absorbed by the root system. Well suited for foliar application. When it enters the soil under the influence of microorganisms, it quickly turns into amino, and then into a nitrate form. Its content is 16, thanks to these properties the use of fertilizer KAS-32 increases the drought resistance of the plant and immunity to diseases and pests.

Fertilizer GSN-2004 is a natural biologically active preparation. It contains essential micro elements, saccharides and various easily digestible acids necessary for the formation of new plant cells, acts as a plant growth activator, immunostimulant, antistress and antidote. In GSN-2004, the molecules are in a transient hydrated state. Its effect increases adaptation to climatic conditions (drought, frost, sharp temperature fluctuation); higher quality of the crop (content of protein, starch,