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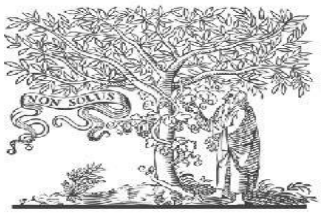

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STUDY OF AGROTECHNICAL AND MEDICINAL PROPERTIES OF AMARANTH AS THE MAIN CROP

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Abstract: Due to the relatively high population growth rates in developing countries, the production of basic foodstuffs cannot meet the food needs of the world's population. Research on the yield potential of these crops is currently at the plateau level. To replace the pressure on these basic crops, it is necessary to look for other alternative crops that can replace the existing food needs and meet them. FAO statistics show that the number of underweight children in developing countries is high, which is primarily due to the reduction of micronutrients in the mother's diet. Amaranth, an unused crop and a source of cheap proteins, minerals, vitamins A and C, seems to be the future crop that justifies this demand due to its huge yield potential and nutritional qualities and has recently gained worldwide attention.

Keywords. Amaranth, Valentina, Aztec, Agrotechnical

Introduction

Nowadays, it is necessary to cultivate high-yielding, water-saving, climate-friendly, world-class, medicinal and high-biomass universal plants. At the same time, it is important to find high-yielding varieties of crops in a short period of time in order to use irrigated land efficiently. One such valuable plant is amaranth. Due to its high productivity and valuable chemical composition, amaranth is now used in the world for food, fodder, siderate crops and in the production of biologically active substances.

UN Food and Agriculture Organization (FAO) experts have declared amaranth to be the 21st century plant among the most widely cultivated plants in the world. According to U.S. researchers, the biological value of amaranth protein was rated 75 out of 100, wheat protein 56.9, soybeans 68, and cow's milk 72.2.

Amaranth was successfully grown in the CIS countries in the 30s and 50s of the XX century, mainly in Ukraine and the North Caucasus as a fodder crop.

Materials and methods.

These days, our government pays a lot of attention to the propagation of medicinal plants and their use in medicine, and the list can include amaranth. Recognized as the plant of the century, this plant is one of the rare medicinal plants in nature, which has healing and protective properties for the human body.

Amaranth - belongs to the family Amaranthus, which includes more than sixty species. Native to South America, it has been cultivated for seed for 8,000 years.

Amaranth is widespread from South America to North America, India and from there to Asia and around the world.

There are now many varieties of amaranth in India and China, which are the secondary home of amaranth. In these countries, amaranth is widely used in local medicine, national cuisine and industry.

The most valuable and healing part of amaranth is its seeds. Research in recent years has shown that amaranth grains outperform traditional traditional food crops in terms of protein, amino acids, vitamins, macro and micronutrients, biologically active substances, and lipids.

Extraction and use of amaranth oil is also one of the most important tasks in medicine today. The lipid content of amaranth seed differs from other traditional oilseeds by its balanced fatty acids, biologically active substances, and the abundance of squalene, tocopherol, sterol, and phospholipids, which are rare in plants.

The production of flour on the basis of waste-free technologies, while fully maintaining the content of biologically active substances in amaranth grains, plays an important role in enriching the raw material base of bakery, increasing the range of bakery and confectionery products and increasing their biological value.

100 grams of amaranth seeds contain 370 calories, containing 7 grams of lipids, 4 mg of sodium, 508 mg of potassium, 65 mg of carbohydrates, 1.7 mg of sugar, 14 mg of protein, 159 mg of calcium, 4.2 mg of vitamin C. , 7.6 mg of iron, 248 mg of magnesium, 0.6 mg of vitamin V6, and other vitamins. Amaranth oil does not contain cholesterol.

Amaranth seeds cause a number of diseases, including: - Respiratory diseases (bronchitis, laryngitis, pleurisy, pneumonia); - endocrine correction (anemia, avitaminosis, obesity, diabetes, goiter); - bone and vascular diseases (osteochondrosis, osteoarthritis, arthritis); - oncological diseases; - Used to increase breast milk in women with young children, to treat insomnia and other sexually transmitted diseases.

Amaranth seeds are very small, weighing 0.7 grams per 1,000 seeds.

The seeds can be white, cream, brown, gray or black. The amaranth stems and colored leaves of the vegetable plant are distinguished by their relative elegance and unique taste. Mainly young stems and vitamin-rich leaves are consumed.

Amaranth oil contains up to 10% of squalene, which has a high therapeutic, anti-tumor and bactericidal effect. Squalene's function is to balance proliferative processes, based not only on the intracellular concentration of the cell, but also on its effect on enzyme activity and the catalyst of its own molecule synthesis and the biogenesis of the common precursors of all active isoprenoids.

Squalene is also involved in the biosynthesis of several hormones in the human and animal body. At the beginning of the century, the biologically active substance belonging to the sterol group, squalene, was discovered in science in large quantities in amaranth oil, and since 1916, only whale and shark liver oils have been extracted industrially.

Amaranth oil is a renewable alternative source of this valuable substance. Amaranth oil is widely used not only in the food industry, but also in the perfumery, cosmetics, pharmaceutical and medical industries.

Amaranth oil has healing properties for stomach and intestinal ulcers and is used to accelerate the healing of skin diseases, cut wounds, and in patients with radiation sickness. Its oil is not inferior to oblepixa oil and is used in the treatment of a number of diseases. Amaranth seeds in medicine help prevent the growth and absorption of malignant tumors caused by cancer.

Amaranth is a heat-loving and light-loving plant.

The amaranth plant grows very slowly in the early stages of growth. Later, its growth and development will accelerate. As the amaranth plant was very demanding on nutrients, its growth and development was very slow in the control variant.

Amaranth is a short-day plant. However, in the experiment, the duration of the amaranth growing season was almost the same when planted in spring and autumn. Generally, short-day plants shorten the growing season

and shorten the growing season. But since amaranth is a very demanding plant, the cold weather in autumn may have slowed its ripening.

The growing season is 80-90 days for early varieties, 100-110 days for medium varieties and 120-125 days for late varieties. In the local conditions, when all the established agro-technical measures are carried out in a timely manner, it is observed that the grain is fully ripe in 70-75 days.

The amaranth flower is popularly known as the "flower-rooster" because it is a small-flowered inflorescence, pink, dark pink, red and crimson, and reminiscent of a rooster's crown. Amaranth is an annual plant that can be grown for a variety of purposes, including vegetables, grains, ornamentals, and food crops. Its leaves can be used as a tea to boost the human immune system.

Vegetable amaranth is very common, especially in Eastern countries, and is included in the daily diet as a green vegetable. Its seeds are widely used not only in medicine but also in various confectionery industries.

In India, Pakistan, Nepal and China, cereals and vegetable amaranth seeds are used to make porridge mixed with sweet corn kernels. Tall varieties are grown as fodder for livestock.

Amaranth protein is better saturated with amino acids than other food crops. Experts estimate that amaranth protein is equivalent to 75 units on a quality scale.

Amaranth is harvested for blue mass during flowering and seed germination. Because during this time the stems and leaves of the plant are rich in vitamins. Depending on the ecological conditions, amaranth can be harvested several times during the growing season. The fact that the protein in the seeds is easily digested when it enters the body means that it is a nutritious food.

In our country, it is grown mainly as a fodder crop. Previously, its velvety flowers were planted only as an ornamental plant for its long-term charm, resistance to external influences and ability to survive for several months in drought. Perhaps for this feature, too, amaranth - immortal. the flower is named.

It is known from history that our ancestor Abu Ali ibn Sina used amaranth extensively in the treatment of wounds and wounds from knives, skin diseases (measles, rubella), bad breath and other diseases.

Amaranth seeds and leaves, which are included in the diet, are widely used as a medicinal food. They are mainly used in the diet of patients with cardiovascular diseases.

At the Botanical Research Institute, seeds of foreign and domestic varieties of amaranth are studied on the basis of valuable economic characteristics. Each of these unique amaranth specimens is a valuable resource for different areas of selection and is provided to breeding grounds.

It is recommended to plant amaranth in stable warm weather (April-May), when the soil depth is heated to 10-12 degrees, so the eyes are happy with the current harvest.

When the plants reach 10-15 cm in height, they are loosened to a depth of 5-6 cm by applying 40 kg of nitrogen and 20 kg of potassium fertilizers per hectare in order to accelerate their development. The second feeding is applied with 30 kg of nitrogen and phosphorus fertilizers per hectare when the plant reaches a height of 30-35 cm. Feeding should be done before watering. Once a plant is fed and watered, it grows and develops faster. The last feeding is completed with nitrogen and potassium fertilizers when he reaches a height of 70-80 cm. During the season, amaranth is irrigated 3-4 times and even 6-7 times, depending on soil conditions, and is fed with 95-105 kg of nitrogen, 70 kg of phosphorus and 50 kg of potassium fertilizers per hectare.

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Results:

Plant varieties

Lema, Bogryanny, Kharkiv-1, Voronezh, Ultra and Gelios varieties of amaranth have been planted in the republic for many years and have given good results. It has grown to 3.5-4 meters and has produced over 200 and even more than 300 tons of green mass, as well as being a very rich source of nutrients rich in essential vitamins in animal husbandry. In Uzbekistan, amaranth is harvested twice a year and used as a secondary crop.

Figure 1. Valentina

Valentina is an early ripening variety used in the food industry and can be used for 1.5 to 2 months. It is rich in nutrients. The leaves are especially rich in vitamins C, E and carotene. Height 110-180 cm. Ready for silage in 40-45 days. It ripens in 105-115 days.

The grain is rich in potassium, calcium, magnesium, phosphorus and especially iron. The stems and leaves are used to make a variety of salads and soups. The leaves are reddish-black.

The leaves and stems contain 18-20% protein.

Figure 2. Aztec

The Aztec variety of amaranth is grown mainly for food. Growth period is 100-110 days. This variety is characterized by high grain and blue mass. The stem is red. Height 160-170 cm. The seeds are dark brown. It is a medium-ripe variety.

Figure 3. Giant

The "Giant" variety is one of the most widely used varieties. Vegetation period is 110-125 days. Height can be 170-195 cm and higher. The blue mass is characterized by sweetness, richness and juiciness. The grain contains -7.9% fat.

Gelios

Height is 150-170 cm in Russia and 300-400 cm in local conditions. The grain is white. It is a high-yielding variety. 6-7 seedlings per 1 m are taken care of.

The green mass yield is 1.5 tons, the grain yield is 15-30 s, and in the conditions of

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Uzbekistan, the growing season can be reduced from 105 days to 90-100 days and even 80 days when cultivated according to the recommendations. Biomass productivity increases by half, and grain yield reaches 50 s per hectare.

The Amaranth variety Gelios was created in the Botanical Garden of the MM Grishka National Academy of Sciences of Ukraine and was registered in the State Variety Testing Register of Ukraine in 2010.

Figure 4. Kharkiv

The Kharkiv variety of amaranth is a universal variety because it is grown for high-yielding green mass and heavy grains. The growing season is 100-110 days. The healing properties of the essential oils, have long been known in ancient times. The yield of green mass per hectare can be 200-250 tons and more. Grain yield is 50-60 s / ha. This type of amaranth is important because it contains a lot of squalene. Widely used in medicine and cosmetology.

Lera

This variety is grown for fodder purposes. The grain contains 7% fat and 20.6% protein. The length of the stem is 170-220 cm, which can be even higher depending on soil and climatic conditions. Loves heat and light. Growth period is 100-105 days. Silo is considered quality. Leaving 5-6 plants per meter gives good results. Oil and flour are extracted from the grain.

Land preparation and planting

In our country, information about the impact of various factors on the growth, development and yield of grain amaranth is being formed. The effect of growth, development and yield of different varieties of this plant, the number of bush thickness and planting depth and duration on plant productivity, the effect of mineral fertilizers on the yield of amaranth planted for fodder and grain In Russia and other foreign countries, a number of studies have been conducted in different soil climatic conditions and cultivation technologies have been developed.

Depending on the purpose of planting and agrobiological characteristics of the variety, as well as soil climatic conditions, amaranth is planted in the scheme 60x15, 60x10, 60x8, 70x15, 70x10,70x8 in spring as a main crop and after grain as a secondary crop.

Seed consumption of amaranth is very low, 0.5-1.5 kg per hectare, grain yield is 40-60 c / ha on average, and even higher in grain varieties. Amaranth seeds are planted at a depth of 1–1.5 cm when the soil temperature is 10–12 degrees.

It is advisable to prepare seedlings of ornamental amaranth samples first and then transplant them to a permanent place. Seed consumption per hectare can be increased up to 2 kg per hectare, taking into account soil and climatic conditions.

Care-Feeding

Amaranth plantations are plowed to a depth of 25-35 cm in autumn. The soil is fertilized with organic and mineral fertilizers before plowing. In early spring, the land is leveled and cleared of weeds. It is recommended to plant amaranth in stable warm weather (April-May) and in areas free of grain. The plant does not choose the ground - it grows well in saline, arid and foothill areas.

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Figure 5. Amaranth plants

Proper timing and timing of planting is a key factor in ensuring that seeds germinate properly. It is important to keep in mind that in addition to the heat, the soil in which the seeds germinate must have enough moisture to germinate, as the seeds are covered with a hard membrane. Therefore, if it is not planted in optimal time or if the surface layer of the soil (up to 4 cm) is dry, it is necessary to keep it moist, such as carrots and onions, until it germinates, taking into account that in dry climates germination is not guaranteed.

The choice of amaranth planting methods is one of the factors that positively affect the yield and its development. Amaranth should be planted in rows of 30, 45, 60 cm between rows, and 70 cm in areas where seeds are sown.

When the row spacing is 60 cm wide, it is recommended to sow an average of 1-2 kg of amaranth seeds per hectare. If the row spacing is 45 cm, the planting rate will increase by 10-15%. When sowing seeds, soaked sand, rotted manure, superphosphate and other products are used as seed fillers in a ratio of 1:10 or 1: 5.

600-700 s per hectare of seedlings left in the areas planted with amaranth, in local conditions the height of some varieties of amaranth increased by 2-2.5 times, and a sharp increase in the amount of green mass was observed. Accordingly, the grain yield can reach 1-1.5 and even 3-4 tons and more.

Caring for amaranth plants is similar to the agronomic techniques of all cultivated plants without the complex process. After planting, the soil should be loosened and weeded. In particular, any soil can be compacted in the spring, which balances the emergence and development of grasses. Therefore, it is necessary to work with light softeners 4-6 days after sowing.

At present, a number of farms are planting amaranth in 60-70-90 schemes, depending on the soil and variety, to obtain a high quality and abundant harvest. In total, 200 kg of pure nitrogen, 150 kg of phosphorus, 100 kg of potassium and 20-30 tons of organic fertilizers are used. git is used. With planting is given 300 kg of ammophos, 50 kg of potassium, 150 kg of urea. If you do not have vegetable seedlings for planting, you can use buckwheat. In this case, every 10-12 cm, 5-6 seeds are sown and pierced.

The seeds are sown to prevent pests from eating them. To do this, mix 60 kg of kunjara, 2 liters of cottonseed oil with 250 grams of karate or otello super and soak for 2 hours. After that, it is sown in the evening. Sprinkling is repeated 3 times every 5 days.

After germination, the thick areas are flattened. In an intensive way, the film is pulled and planted every 10 cm with a bucket and sprinkled with bait. In the same way, they get a good harvest.

In the first 2–3 weeks, after the emergence of weeds, the main focus should be on loosening the rows between weeds and weeding.

When the plants reach a height of 10-15 cm, cultivation is carried out at a depth of 5-6 cm, with 40 kg of nitrogen and 20 kg of potassium fertilizers per hectare, in order to accelerate their development.

The second feeding is applied with 30 kg of nitrogen and phosphorus fertilizers per hectare when the plant reaches a height of 30-35 cm. Feeding should be done before

watering. Once a plant is fed and watered, it grows and develops faster.

The last feeding is completed with nitrogen and potassium fertilizers when he reaches a height of 70-80 cm. Amaranth is watered 6-7 times during the season.

The green mass of the amaranth plant is harvested from the flowering phase to the milky-waxy ripening stage of the seeds. Amaranth is harvested 2-3 times by July. This will allow new weeds to emerge from the root system by the end of July. Due to the high protein content of amaranth green mass, it is widely used in animal husbandry in the production of silage and other foods.

The effect of organic and mineral fertilizers on the growth and development of amaranth, the reaction to soil fertility, and the irrigation system are poorly understood in Uzbekistan.

The influence of various factors on the growth, development and productivity of this valuable plant in different soil and climatic conditions in the country is being studied by researchers of scientific institutions.

Even when amaranth was planted as a secondary crop, the effect of mineral and organic fertilizers on its growth and development was similar to that of the main crop.

The application of mineral fertilizers in combination with manure maximized plant growth and development.

The use of organic and mineral fertilizers also has a positive effect on the duration of growth of amaranth. Due to the lack of nutrients, the vegetation period of amaranth is prolonged and, conversely,

Improving the soil nutrient regime with the use of mineral fertilizers leads to a shortening of the amaranth growing season. This is especially true when manure is used in combination with mineral fertilizers.

The use of mineral and organic fertilizers in the experiment also had a positive effect on grain and biomass yield of grain amaranth. Re-planted grain amaranth is harvested immediately after ripening.

Conclusion and discussions

The effect of mineral and organic fertilizers on the growth, development, yield and biomass formation of a valuable universal plant - grain amaranth has been studied as a primary and secondary crop in Uzbekistan. Amaranth seeds are now widely used in various sectors of the economy, including food and pharmaceuticals.

Experiments have shown that a number of varieties of amaranth can be grown as a primary and secondary crop in Uzbekistan. The use of mineral fertilizers in combination with organic fertilizers in the cultivation of grain amaranth allows to obtain high amounts of grain and biomass. The amaranth plant is very demanding on soil fertility and nutrients, and fertilizer application rate of N200-250, P150, K200 and 30 tons of manure per hectare gives good results.

In addition to providing up to 300 tons of green mass when cultivated at the required level, some varieties have a positive effect on the health of all types of livestock, dramatically increase productivity, especially milk, and significantly accelerate growth and development. Meat and milk from animals fed with amaranth are considered medicinal. Therefore, the price of livestock products grown with amaranth abroad is much higher, and in stores it is written amaranth meat, amaranth milk.

In the cultivation of amaranth, most of the nutrients assimilated by the plant are returned to the soil by the biomass. This biomass is important in increasing the amount of organic matter in the soil. It is also important to study amaranth as a secondary siderate and fodder crop. The growing population of the republic has made it difficult

for agricultural specialists to grow more food. Propagation of amaranth and its use in almost all sectors of the economy is one of the most pressing issues today. The body and leaves are used in animal husbandry, in the preparation of food from leaves and grains, and in many fields of medicine. The fact that the yield is the same as wheat and the income is tens of times higher is a new source of income for farmers.

Cultivation of amaranth in Uzbekistan is the cultivation of valuable medicinal products in our country at low prices, enrichment with siderate and high-yielding fodder crops, the opening of new directions in agriculture and pharmaceuticals, the main thing is to increase the natural fertility of our depleted soil. creates an opportunity.

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