



AGROTECHNICS AND BREEDING PROSPECTS FOR ALLIUM STIPITATUM REGEL

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Abstract: The article shows the development of scientifically based agrotechnical methods of seed propagation under the conditions of the introduction of Anzur onion, its effective development on irrigated soils, and the increase in productivity with proper irrigation and care during the growing season. The fact that generative methods of plant propagation negatively affect economic indicators in terms of time, that it takes an average of 4-5 years for plants grown from seeds to bloom and bear fruit, and even more time for total productivity, the germination of seeds in laboratory and field conditions, the optimal sowing time, sowing depth of 2-3 cm, standard seed consumption of 3.5-4 kg/ha, and germination up to 90% are provided.

Keywords: spring onion, *Allium stipitatum* Regel, vegetative propagation, seed germination, onion head, generative propagation, planting agrotechnics, cultivation.

Introduction. The world's population is constantly growing, which is why their demand for food, that is, plant products containing biologically active substances, is also increasing. According to the Food and Agriculture Organization, more than 50,000 medicinal plants are used in medicine today.

Extensive scientific research is being conducted around the world to preserve medicinal and essential oil plant species, adapt them to different climatic and soil conditions, and widely introduce them as a source of raw materials. In this regard, special attention is paid to determining the agrobiological properties and phytochemical composition of plants, studying the genetic differences of ecotypes, improving organic and biological cultivation methods, and analyzing species used in traditional medicine at the genome level and creating biopharmaceutical products based on them.

One of the important conditions for the introduction of Anzur onion is the development of methods for its propagation. Based on the results obtained during the study of the plant, it was determined that this species can be recommended as a medicinal and essential oil-bearing, nutritious plant. Therefore, it is urgent to develop scientifically based methods for its propagation in order to grow this plant in large plantations. Anzur onion is a perennial ephemeroïd plant that reproduces vegetatively (bulbs) and generatively (seeds).

Literature review. The research conducted experiments on methods of propagation of Anzur onion (seed and bulb). Seed germination is one of the important indicators that ensure the reproduction of plants through seeds and the alternation of generations in populations, determines the survival strategy of the species and expresses the quality of seeds. Y.I. Proskoryakov, who has deeply studied the issues of seed biology of representatives of the

Central Asian flora, noted that seed germination is closely related to the biological characteristics of the plant species.

The width of a species' range is directly determined by the range of ecological requirements of the seed. In other words, the wider the range, the greater the difference between the minimum and maximum values of the key factors necessary for seed germination.

E.A. Khodachek, in his studies of the flora of Western Taimyr, found that the degree of seed germination depends on the ripening period of their fruits, the time of seed collection, and the stratification process. In particular, it was noted that cold stratification has a positive effect on the germination of seeds of many species.

As a result of our research, the germination of Anzur onion seeds in laboratory and field conditions was determined in percentages. Anzur onion is not very demanding on soil, water, or fertilizers. However, it was found that the most suitable soils for its cultivation are gray, fertile, and water-rich areas. The results of the research showed that Anzur onion can be planted and propagated under introduced conditions [7; 372–395-b.].

When the plant is propagated mainly by seeds, it is necessary to select areas with proper agrotechnology, well-plowed in the fall, and cleared of weeds. Before planting Anzur onions, the soil should be plowed to a depth of 25–30 cm. Based on the morphological structure of the plants and the area they occupy, they were sown at the rate of 3.5–4 kg per hectare. The depth of sowing of seeds was determined by the weight and size of the seeds, and based on the information provided in the literature, the sowing distance was 60x10 cm, and the sowing depth was 2–3 cm, and the seed germination was high [2; 491–495-b., 3; 134–137-b.].

Seeds are sown in the fall and germinate in early spring when the air temperature is 10–12 °C. Depending on the field conditions, weeding was carried out during the leafing period. During the vegetation period, the area planted with plants was irrigated 2–6 times, taking into account the water requirements of the plant. After each irrigation, the row spacing was cultivated with a hoe and maintained. The productivity of the above-ground organs of the plant directly depended on the environment in which the plant was grown and the order in which agrotechnical measures were carried out.

The successful cultivation of *Allium stipitatum* in the conditions of introduction and the establishment of stable plantations depend on the biological and agrotechnical justification of the propagation methods. This species is mainly propagated vegetatively, that is, with the help of bulbils, its productivity increases. The vegetative propagation method is important because it fully preserves the hereditary and morphobiological characteristics of the plant, shortens the period of generative development, and allows obtaining planting material with the same economic indicators.

The bulbs of Anzur onion have a morphophysiological complex structure, they act as an organ that stores nutrients and provides vegetative regeneration. The germination and subsequent ontogenetic development of bulbs are inextricably linked to environmental factors, in particular soil moisture, temperature regime and agrochemical composition of the soil. During the research, it was found that active root formation of bulbs occurs intensively when the soil temperature is 8–12 °C, which indicates the biologically optimal timing of autumn planting.

When selecting experimental sites, special attention was paid to the mechanical composition, fertility and water-physical properties of the soil. According to the results of the study, gray, medium loamy, moisture-retaining soils are considered the optimal environment

for Anzur onions. On saline, near-surface and compacted soils, rooting and vegetative development of onion heads were significantly slowed down.

Before planting, the fields were subjected to deep agrotechnical treatment. Autumn plowing was carried out to a depth of 25–30 cm, as a result of which the water and air regime of the soil improved and favorable conditions were created for the deep development of the root system. Physiologically mature, healthy and mechanically undamaged onion heads weighing 5–34 g were selected as planting material.

In experiments, it was found that the most favorable period for planting Anzur onions is the third decade of October and the first decade of November, based on data presented in the literature [5;58–63-b.].

Discussion. The onions were planted at a spacing of 20 cm. The optimal depth parameters depended on the size of the onions, with large onions planted at a depth of 20 cm, medium-sized onions at 12 cm, and the smallest at 7–8 cm [4;32–36-b.].

The planting scheme was determined based on the biomorphological characteristics of the plant, with row spacing of 70x20 cm. Agrotechnical care measures were carried out regularly during the growing season. Irrigation rates were determined based on soil moisture and meteorological factors, and irrigation was carried out an average of 2–6 times during the growing season. After each irrigation, weeds were removed and row spacing was cultivated to loosen the soil layer.



Figure 1. Cultivation techniques

At the same time, when analyzing the senopopulation of anzur onion in a 5×5 m area, it was revealed that a weed community was formed in it. The community is dominated by annual therophytes (*Amaranthus retroflexus*, *Portulaca oleracea*) and perennial rhizomatous species with strong vegetative propagation (*Cyperus rotundus*, *Cynodon dactylon*).

The Anzur onion plant can be propagated in a cultural setting using generative (seeds) and vegetative (bulbs) methods. In this case, it takes a long time to obtain a bulb and seed crop. For germination from seeds, it is also necessary to use a dormant period or additional germination methods. The reason is that anatomical analysis of the plant's seeds shows that they contain oil and essential oils, which partially prevent moisture from reaching the seed coat. And this is why it takes time for the seeds to germinate.

According to the results of repeated 3-year experiments, it is economically feasible to propagate the onion plant mainly vegetatively. When vegetatively propagating plants, positive results are shown when their bulbs are planted in the autumn months of October and November. Significantly better options are considered bulbs planted in the 3rd decade of

October and the 1st decade of November, which is observed with a relative decrease in air and soil temperature by 25-30 °C. This is typical for most bulbous plants (species of representatives of the *Allium* genus, tulips, saffron, etc.), and information on this is provided in the literature (Sharipov, 1979, Makhmudov, 2016, Tukhtayev et al., 2018).

In early autumn, designated areas for planting onion heads are prepared and 1200-1400 kg of onion heads per hectare are planted to a depth of 12-20 cm, depending on the size. Timely implementation of agrotechnical measures with rotted manure in the areas ensures the subsequent development, reproduction and increase in productivity of onions.

Planting Anzur onions as described above will help the plant establish a root system, develop seasonal roots, develop shoots, and later form good onion heads. The establishment of the root system will depend on climatic conditions and soil conditions.

The underground growing season of Anzur onions begins in autumn. The bulbs of the plant planted underground begin to sprout in autumn and it is possible to observe the formation of a formed bud in them. This state is maintained throughout the winter. As soon as the days begin to warm up, that is, when the air temperature rises to 5-10 °C, it is possible to observe the beginning of the above-ground growing season in them. The beginning of the above-ground growing season in Anzur onions directly depends on climatic conditions and can be observed to occur in late January or early February, and its duration can be observed to last until late May or early June.

It should be noted that during vegetative propagation, the formation of true leaves in plants, biometric measurements during the propagation process depend on the size of the planted bulbs and the experimental variants. In the control variant, 1- and 2-year-old bulbs with a diameter of 0.3-0.5 cm, depending on the growth conditions, the relatively narrow leaves in the first years, the small diameter of the inflorescences, and the low number of seeds produced are clearly visible during the vegetation period.

The onion heads of the second variant, planted with chemical treatment, show a partial advantage compared to the other variants. The results of the observations clearly show that the vegetation process in the third and fourth variants, planted in the same place, is slow, while the greening of the third variant is at the lowest level, while the vegetation period and seed yield of the fourth variant are significantly lower than in the other variants.

In vegetative propagation, the development and yield of plants directly depend on the size of the bulbs, and it was observed that it is possible to obtain a harvest from seeds and bulbs from the same year of planting. Based on this, it is advisable to propagate plants using vegetative methods. In this case, it was observed that bulbs with a diameter of more than 30 cm increased by 2 or even 3 pieces in the first year.

Based on the above, it is possible to understand that the onion is extremely beneficial for human health in the current era of increasing infectious diseases, its benefits in preventing a number of diseases, and its ability to meet the population's demand for natural nutrients. If plantations are formed to grow it, it will be economically beneficial due to the low labor and cost required. The above information shows how necessary the plant is.

Conclusion

1. In the context of the introduction of Anzur onion, scientifically based agrotechnical methods for its propagation by seeds were developed and practically substantiated. As a result, the germination of seeds in laboratory and field conditions, the optimal sowing time (late

autumn), sowing depth (2-3 cm) and the standard seed consumption (3.5-4 kg/ha) were determined, ensuring high germination (up to 90%).

2. It was proven that the plant develops effectively on fertile, well-cultivated and irrigated soils, and proper irrigation and care during the growing season increase productivity. As a result, the possibility of growing this species as a medicinal, essential oil, promising crop on large plantations was scientifically determined.

3. When propagating *Allium stipitatum* Regel in culture by the vegetative (bulb) method, it is effective to plant bulbous bulbs that are healthy, not mechanically damaged, and not too small in size.

4. Plant propagation by generative methods has a negative impact on economic indicators in terms of time. As a result, it was found that it takes an average of 4-5 years for plants grown from seeds to flower and bear fruit, and even longer for total productivity..

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