

RESPONSE OF SUNBERRY TO DIFFERENT CLIMATIC CONDITIONS

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Most of the vegetable cultivar families Nightshade food from the Central American or South American center, and therefore, the desire for growing conditions All these factors are indispensable, but equivalent. A complex of external effects affecting the association of plants into 4 groups:

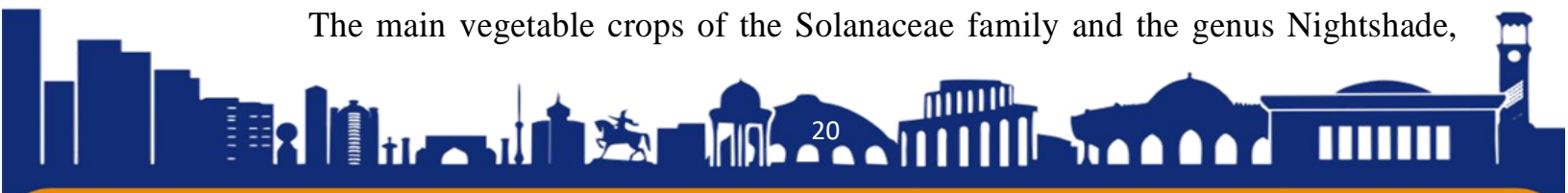
- climatic (light, temperature, air humidity);
- edaphic (water supply and universal nutrition);
- bio-macrotic (harmful and beneficial microflora, flora and fauna, interaction of plants in crops);
- anthropogenic (associated with human activities) (Bunin et al., 2006).

There is little information in the popular literature about relation of garden nightshade Sunberry to growing conditions. Often these data differ from each other, and in some cases they are even contradictory.

Temperature is one of the main factors in plant life; it affects respiration, assimilation and other physiological processes in plants. According to the requirements for heat, V.I. Edelstein divided vegetables into 5 groups:

- frost-resistant and winter-hardy (tolerate frosts down to -80C, and the temperature optimum is 15-20C);
- cold-resistant (tolerate frosts down to -50C, and the temperature optimum is 18-25C);
- intermediate between cold-resistant and heat-loving (the aerial part dies at a temperature of 0C, and the optimum temperature is 17-21C);
- demanding for heat (slow death begins at a temperature of + 3-5C, and at - 0.5-1.0C death occurs. The optimum temperature for growth and development is 20-30C);
- heat-resistant (the aerial part dies at a temperature of 0C, the optimum growth temperature is 30-40C).

The main vegetable crops of the Solanaceae family and the genus Nightshade,



tomato, pepper, eggplant, belong to the group of plants demanding heat. Their seeds begin to germinate at a temperature of 15-16°C, and the optimum temperature for germination is 25-30°C. The optimum temperature for the growth and development of these crops is 20-30°C. A decrease in temperature below 15°C and an increase above 30°C adversely affects the growth and development of plants. In relation to air temperature, Sunberry nightshade should be attributed to heat-demanding crops like tomato and eggplant, which have the same region of origin and belong to the same botanical genus Nightshade (Bunin et al., 2006, Zuev V.I., et al. 2016).

As you know, solar energy is a major factor in the life of green plants. Due to solar energy, carbon dioxide and water with the help of chlorophyll, green plants are able to create and accumulate organic compounds. In relation to light, vegetable crops are distinguished by the following features: reactions to light intensity, spectral composition, and length of day and night.

In Sunberry nightshade, they are almost the same as in tomato, and it grows on soils of almost any mechanical composition. It is preferable for Sunberry drained, well-warmed, fertile, sandy or loamy soils, with a slightly acidic or neutral (pH 6.1-7.5) reaction.

The best predecessors are plants of the Cabbage and Pumpkin families, as well as root crops and green crops. Re-cultivation of Sunberry in the same area is recommended no earlier than after 3-4 years. The same requirements apply to other cultures of the Solanaceae family (Zuev V.I., et al. 2009). Popular literature notes that Sunberry nightshade grows well in soils of varying fertility, but gives higher yields on fertile, well-cultivated sandy or loamy soils. There is a positive effect of organic and mineral fertilizers on the yield of Sunberry nightshade in the open field. Some researchers recommend applying 40-60 t/ha of humus under Sunberry nightshade, others recommend applying 250-300 kg/ha of complex fertilizer such as azophoska as the main fertilizer.





There are no scientifically based recommendations on the application of mineral fertilizers under Sunberry nightshade in the open ground of Uzbekistan. In relation to soil moisture, vegetable crops are divided into 4 groups: the most demanding, highly demanding, less demanding and resistant to arid conditions. Common crops of the Solanaceae family, Solanaceae genus

differ in their requirements for soil moisture. Thus, eggplant is one of the most demanding crops, tomato is highly demanding, and potatoes are less demanding crops (Andreev, 2002). There is no Sunberry nightshade in the existing classification. According to the available literature data, Sunberry nightshade is a relatively drought-resistant plant, however, it requires a large amount of water to form a large vegetative mass and a high yield of fruits. In almost all literary sources, it is noted that timely sex has a positive effect on the growth and development of plants and contributes to an increase in the yield of Sunberry nightshade in the open field. There are no scientifically substantiated recommendations for irrigating Sunberry nightshade in the open field in the conditions of Uzbekistan (terms, norms, development phases, etc.). In the absence of evidence-based recommendations for irrigation, one should be guided by the general feature of vegetable crops, the most efficient use of moisture from the soil at 70-85% of the lowest moisture capacity (LW). The development of the root system is an important indicator of the ratio of vegetable crops to soil moisture. Plants with strong, deep root systems extract water from a larger volume of soil and from its deeper layers. As you know, according to the development of the root system, vegetable crops are divided into 4 groups: with a highly branched root system (to a depth of 2-5 m), a relatively strongly branched root system (to a depth of 1-2 m), with highly branched roots (the roots penetrate into subarable horizons to a depth of 50-60 cm), with a string-like root system (the roots are concentrated in the arable horizon and form a small number of root hairs). The main vegetable crops of the nightshade family of the genus Nightshade belong to crops with a relatively highly branched root system (tomato when sowing seeds in the ground) and with highly branched roots (eggplant and tomato when grown through seedlings). Nightshade Sunberry is not included in this classification. In the literature, it is noted that Sunberry nightshade has a powerful root system capable of penetrating deep into the subsurface horizons.

Relative humidity (RH) has a great influence on the growth and development of plants, resistance to physiological and fungal diseases. The optimal RHV depends on the species characteristics of the crop and ranges from 50-60% for gourds to 80-95% for cucumber and cabbage. The optimum relative air humidity for common vegetable crops of the Solanaceae family is at the level of 60-80% (Matveev, Rubtsov, 1985). Excessive air humidity prevents fertilization and increases the damage of plants by bacterial and fungal diseases. For common crops of the Solanaceae family - first of all, black bacterial spot and late blight (Dementieva, Vygonsky, 1988). With a lack of moisture in the air, top rot appears on the fruits of the tomato. There are no scientific literature data on optimal air RH for Sunberry nightshade. Vegetable crops also differ in their susceptibility to the concentration of salts in the soil solution. According to salt tolerance, vegetable crops are divided into 3 groups: highly salt-resistant (withstand salinity up to 1%), medium-salt-resistant from 0.4 to 0.6%) and salt-resistant (from 0.1 to 0.4%) (Tarakanov, Mukhin, 2002). Vegetable crops of the Solanaceae family tolerate high concentrations of soil solution quite well and are classified as high-salt-resistant (eggplant) and medium-salt-resistant (tomato) crops. There are no data on the ratio of Sunberry nightshade to the concentration of salts in the soil solution.

Many cultivated plants of the Solanaceae family, when grown in the open ground of Uzbekistan, are affected by pests and diseases. Among the pests, the most harmful are the Colorado potato beetle, aphids and scoops. Among viral diseases, mosaic, streak and bronze tomato are often found. Of the bacterial diseases, the most harmful are bacterial black spot and bacterial cancer, and of fungal diseases, late blight, anthracnose, macrosporiosis, gray rot and diplodiniasis. There is evidence in the literature that Sunberry nightshade plants, when grown outdoors, can be damaged by the Colorado potato beetle and aphids. Information on the resistance of Sunberry nightshade to viral, bacterial and fungal diseases when grown outdoors in Uzbekistan.

List of used literature

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