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Formation of The Root System of Salsola Arbuscula in Caulbruary Conditions

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Abstract: The article presents the stages of development of the root system of Boyalich- Salsola arbuscula introduced in the conditions of Karanabchol in the 1st, 2nd and 3rd vegetation years.

Keywords: boyalich, vegetation period, main root, side roots, horizontal, vertical, arrow root, universal type roots.

INTRODUCTION

Nowadays, the problem of ensuring food security is one of the most urgent tasks of our republic due to the sharp increase in the population. Effective agricultural use of the desert and semi-desert regions of our republic is important in finding a solution to these problems. The lands of the desert and semi-desert regions have been used as pastures for a long time, and the development of pasture livestock is the most favorable area in the region. Currently, 20.1 million hectares of land used as pastures in our republic. One of the most important reasons for the pasture crisis is the deterioration of the ecological situation, global climate changes, the reduction of biological diversity, the consequences of inefficient use of natural pastures, and the natural tragedy of the island, which is increasing day by day.

The root system of desert nutritious semi-shrub plants is characterized by deep penetration into the soil and wide spread to the sides. For example, izen (Kochia prostrata L.) Schrad) and camphorosma (Camphorosma lessingii L.) plants form root systems of universal type that penetrate deep into the soil under conditions of cauliflower. In the horizontal direction, its roots spread at a distance of 355 cm. The roots of camphorosa penetrate to a depth of 600 cm, and the lateral roots spread horizontally at a distance of 255 cm. (Shamsutdinov Z.Sh., Ibragimov I.O. 1983). Representatives of various life forms in different environments of desert regions develop preferentially in sandy ecological environment, semi-shrubs and accumulate nutrient mass. For example, the underground part of izen, teresken, kamforosma penetrates to a depth of 5-6 meters in perennial crops in sandy soils. Although the depth (vertical) development of the underground part of psammophyte plants (candy, cherkaz) does not exceed 4-5 meters, their lateral (horizontal) development is found to be 10 meters and even longer (Makhmudov M.M., Khalilov Kh.R, 2015).

In the conditions of the Kyzylkum desert, it was determined that the roots of the keyreuk (Salsola orientalis) plant penetrated to a depth of 143 cm in the first year of its vegetation, and spread horizontally to a distance of 158 cm. (Ortikova L.S., Makhmudov M.M. 2017). In the process of growth and development of plants in the conditions of the Karnab desert, the main root system penetrates a little deeper than in the conditions of the pre-mountain semi-deserts (hills) (Bobaeva A.S, 2014).

Research object and methods. The roots of the Salsola arbuscula plant brought from the Moynaq district of the Republic of Karakalpakstan served as the object of research. "Trancheya" methods proposed by (Taranovskaya M.G. 1957, Shalyt M.S. 1960) were used to study the formation of the root system of the plant.

Research results. According to our experiments, we found out that the Boyalich plant is composed of the following layers of the soil section profile in the study of the formation of the root system:

- 100-110 cm surface layer of the soil consists of light-brown gray soil; From the depth of 100-110 cm, the sandy-gravel layer begins and its thickness reaches 200-210 cm; From the depth of 200-210 cm, the sandy layer begins.

In the first (2016) year of vegetation, the main arrow root of the Boyalich plant was found to penetrate the soil to a depth of 80 cm. In the relatively superficial layer (0-10 cm), it was found that more than 10 lateral roots, 10-15 cm in length, emerging from the main axis root were developed (Fig. 1 a). These lateral roots are mainly located in the horizontal direction in the arable layer.

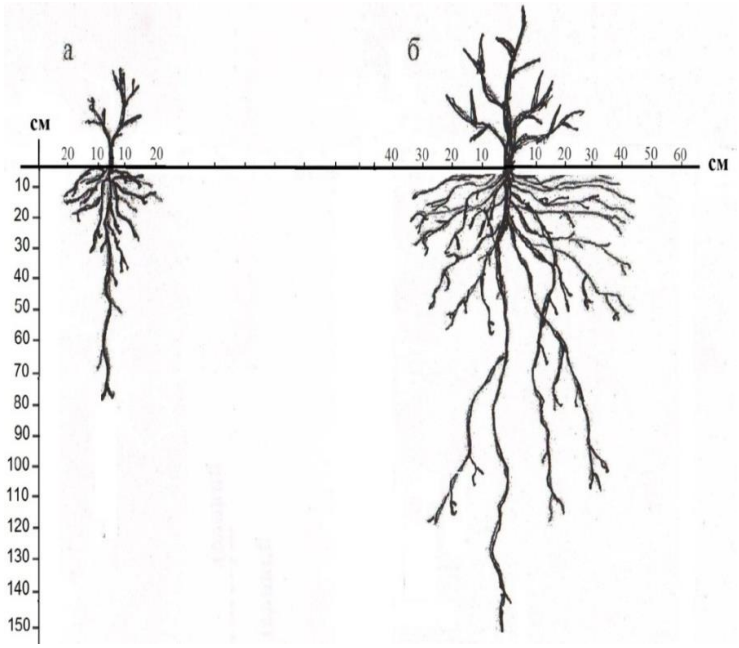

Figure 1. The formation of the root system of Salsola arbuscula in cauliflower conditions, the 1st of vegetation (in 2016) (a), the 2nd of vegetation (in 2017) (b).

In the second (2017) year of Salsola arbuscula vegetation, it was found that the number of main arrow roots reaches 4 and penetrates to a depth of 150 cm into the soil (Fig. 1, b). It occupies a width of 60-70 cm (Fig. 1 b). It was found that the longest axis root ends in the sand-gravel layer. The study of the root system of three-year-old Salsola arbuscula showed that from the root neck, the main axis roots with a thickness of 3 vertical directions were developed, which penetrated into the soil to a depth of 220 cm (Fig. 2).

More than 30 lateral roots 50-60 cm long were found in the relatively surface layer of the soil (0-80 cm). Therefore, the lateral roots located in the surface layer of the soil provide the plant with the moisture present in the soil in the spring season, while the axial roots, which penetrate deep into the soil in the vertical direction, provide the plant with condensation (moisture formed as a result of the upward movement of underground water).

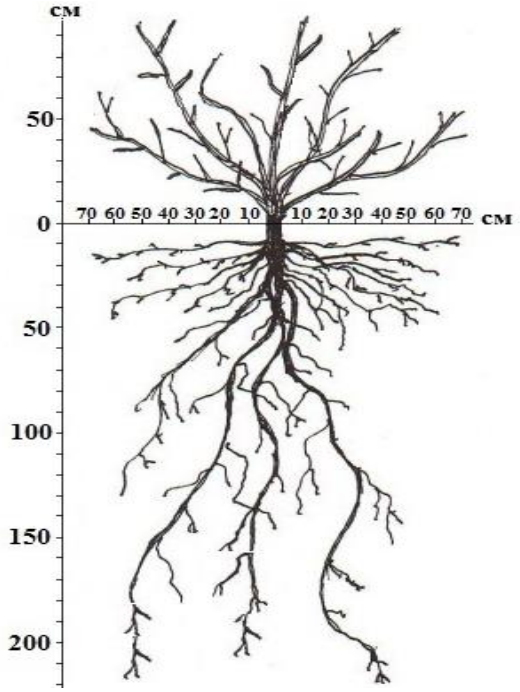

Figure 3. Root system formation of Salsola arbuscula plant in the 3rd year of its vegetation, Karnabchol, 2018.

In conclusion, it can be said that Salsola arbuscula plant in Cauliflower conditions forms a universal type root system that penetrates deep into the soil, occupying a large amount of soil, and this feature indicates its potential to adapt to Cauliflower soil conditions.

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