

EFFECT OF IRRIGATION REGIMES ON GREEN MASS PRODUCTIVITY OF CORN VARIETIES

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Abstract. This article presents the results of research on the effect of irrigation methods on the yield of green mass of corn varieties "Uzbekistan-601 ESV", "Karasuv-350 AMV" and "Uzbekistan-300 MV" grown as main and repeated crops in the conditions of moderately saline, meadow-alluvial soils of the Republic of Karakalpakstan. According to the results of the research, in the conditions of moderately saline, meadow-alluvial soils of the southern Aral Sea region of the Republic of Karakalpakstan, the variety of corn "Uzbekistan-300 MV" was grown with a soil moisture of 70-70-60% before irrigation, in the main crop in the 1-2-0 irrigation system, repeated crop as 0-1-0 system irrigation was found to be acceptable. Then, the highest green mass was 93.9 c/ha in the average 3 years (after grain harvesting) when grown as a main crop, and 36.0 c/ha in repeated crop.

Keywords: meadow-alluvial soils, irrigation methods, corn varieties, main crop, repeated crop, green mass, productivity.

Аннотация. В статье представлены результаты исследования влияния методов орошения на урожай зеленой массы сортов кукурузы "Узбекистан-601 ЭСВ", "Карасув-350 АМВ" и "Узбекистан-300 МВ", выращиваемой как основной и повторный урожай в условиях умеренно засоленных лугово-аллювиальных почв Республики Каракалпакстан. Согласно результатам исследования, в условиях умеренно засоленных лугово-аллювиальных почв южного Приаралья Республики Каракалпакстан сорт кукурузы "Узбекистан-300 МВ" выращивался при влажности почвы 70-70-60% до полива, как основной урожай по системе полива 1-2-0, а повторный урожай — по системе 0-1-0. Таким образом, наибольшая зеленая масса составляла 93,9 ц/га в среднем за 3 года (после уборки зерна) при выращивании как основного урожая и 36,0 ц/га при повторном урожае.

Ключевые слова: лугово-аллювиальные почвы, методы орошения, сорта кукурузы, основной урожай, повторный урожай, зеленая масса, продуктивность.

Introduction. Farming in the soil-climate conditions of the Republic of Karakalpakstan differs sharply in a number of complexities compared to other regions of our country. The climate is relatively dry, the soil is in a poor state of reclamation, and it is saline to varying degrees. In this situation, secondary salinization can be observed if irrigation is not carried out properly. Therefore, development of optimal irrigation methods in the maintenance of agricultural crops, including corn varieties, in order to obtain a high yield from them, is an important task.

It is known that, along with corn grain yield, its green mass is an important source of feed in animal husbandry. Grain and green mass of corn varies depending on soil and climate conditions, varieties, agrotechnics of cultivation.

By M.R. Amin Yahya [1; 28-31-p.] mentioned that on the mountainous red-brown soils of North Yemen 45.7-55.75 c/ha of mid-season Txama hybrid corn green mass without exceeding the permissible limits for irrigation with conditionally treated municipal wastewater, contamination of soil and plant products, the use of underground water for irrigation causes a decrease in the yield of green mass of corn by 8-11% and 17-27%, respectively, in comparison with irrigation with wastewater, it is necessary to strictly maintain the optimal water regime of the soil in the technology of corn irrigation.

In the experiments of S.S. Ishmetov., F.R. Abdiev [2; 214-217-p], the following information was obtained as a result of scientific research, such as determining the yield of green mass of corn variety samples and determining grain yield. In parallel with the grain yield, the yield of green mass was found to be 33.8 c/ha in the Liniya 35 sample, and 60.5 c/ha in the local Kelajak 100 sample.

The study investigated the effect of irrigation procedures on the yield of green mass of corn varieties.

Research methods. The researches were conducted in the experimental farm of Karakalpakstan Agricultural Scientific Research Institute in 2020-2022 as the main and repeated crops of "Uzbekistan-601 ESV", "Karasuv-350 AMV" and "Uzbekistan-300 MV" corn varieties. Each variety was irrigated with 60-60-60, 70-70-60 and 80-80-60% soil moisture compared to field capacity before irrigation, and green mass yield was studied after grain harvest.

The experiment was carried out in 9 variants in the main and repeated crops. The area of each plot is 480 m² (row length 50 m, width 8 rows 0.6x8=480 m²), of which 240 m² is taken into account. The experiment was in 3 replications, and all variants were systematically placed in the same tier.

The soil of the experimental field is a semi-hydromorphic soil, the level of underground water is 2-3 m.

Analysis and results. In the experiment, research on the effect of irrigation procedures on the accumulation of green mass (leaf stem) of corn varieties was studied in the main and repeated periods of 2020, 2021 and 2022. In the experiment, the green mass yield of corn varieties is close to each other depending on the years of the experiment, and the three-year average green mass yield was analyzed. The obtained data are presented in Figures 1 and 2.

According to the data obtained in the experiment, irrigation was carried out in the order of 60-60-60% soil moisture before irrigation compared to field capacity, and 36.7 t/ha of green mass was obtained in Uzbekistan-601 ESV corn variety planted as the main crop (on average in 2020-2022). The Karasuv-350 AMV variety irrigated with the same irrigation method produced 32.9 t/ha, and the Uzbekistan-300 MV variety produced 37.7 t/ha of green mass per hectare in an average of three years.

It should be noted that in the experiment, the soil moisture before irrigation was 60-60-60% in relation to field capacity, according to the irrigation order 0-1-0, irrigation was carried out once, the irrigation rate was 1340; 1339; 1330 m³/ha, 70-70-60% irrigation in 1-2-0 system, one-time irrigation rate was 972-1047 m³/ha, and seasonal irrigation rate was 3107; 3002; 3048 m³/ha. It was irrigated in the 1-4-0 system in the order of soil moisture 80-80-60% compared to field capacity, with a one-time irrigation rate of 630-740 m³/ha and a seasonal irrigation rate of 3456; 3458; 3443 m³/ha.

The yield of green mass is 41.1 t/ha in the Uzbekistan-601 ESV variety when irrigation is carried out in the order of 70-70-60% of soil moisture in relation to field capacity, from Karasuv-350 AMV variety, 41.4 t/ha per hectare were obtained, Uzbekistan-300 MV variety was 44.4 t/ha on average in three years. It can be said that in the experiment with 70-70-60% irrigation, high green mass was obtained from corn varieties, 4,4; 8,5; 6,7 t/ha higher green mass yield was achieved for varieties compared to irrigated variants with 60-60-60% soil moisture compared to field capacity.



Figure 1. Effect of irrigation regime on green mass yield of corn varieties planted as main crop in c/ha.

Among Uzbekistan-601 ESV, Karasuv-350 AMV and Uzbekistan-300 MV varieties irrigated in the order of irrigation 80-80-60% with pre-irrigation soil moisture relative to field capacity, on average, 42.6; 45.0 and 45.6 t/ha of green mass was obtained in three years, respectively and it was noted that the highest green mass was obtained in relation to lower irrigation methods.

Uzbekistan-601 ESV, Karasuv-350 AMV and Uzbekistan-300 MV varieties planted as a repeated crop made it possible to obtain the following green mass when the irrigation method of corn varieties was studied. Irrigation was not required in the regime of 60-60-60% of soil moisture in relation to field capacity, and the average amount of green mass was 27,7; 29,1; 32,3 t/ha in three years.

When irrigating Uzbekistan-601 ESV, Karasuv-350 AMV and Uzbekistan-300 MV corn varieties with 70-70-60% soil moisture in relation to field capacity, the average yield for the respective varieties in three years was 33.3, 35.0 and 35.6 t/ha of green mass was obtained and 5.6, 5.9 and 3.3 t/ha of additional green mass was provided compared to irrigation in the regime of 60-60-60% of soil moisture in relation to field capacity.

In saline, semi-hydromorphic soils, when the pre-irrigation soil moisture is 80-80-60% compared to field capacity, the Uzbekistan-601 ESV corn variety has an average yield of 33.7 t/ha in three years, the Karasuv-350 AMV variety has 35.3 t/ha per hectare, and Uzbekistan-300 MV variety accumulated 36.5 t/ha of green mass.

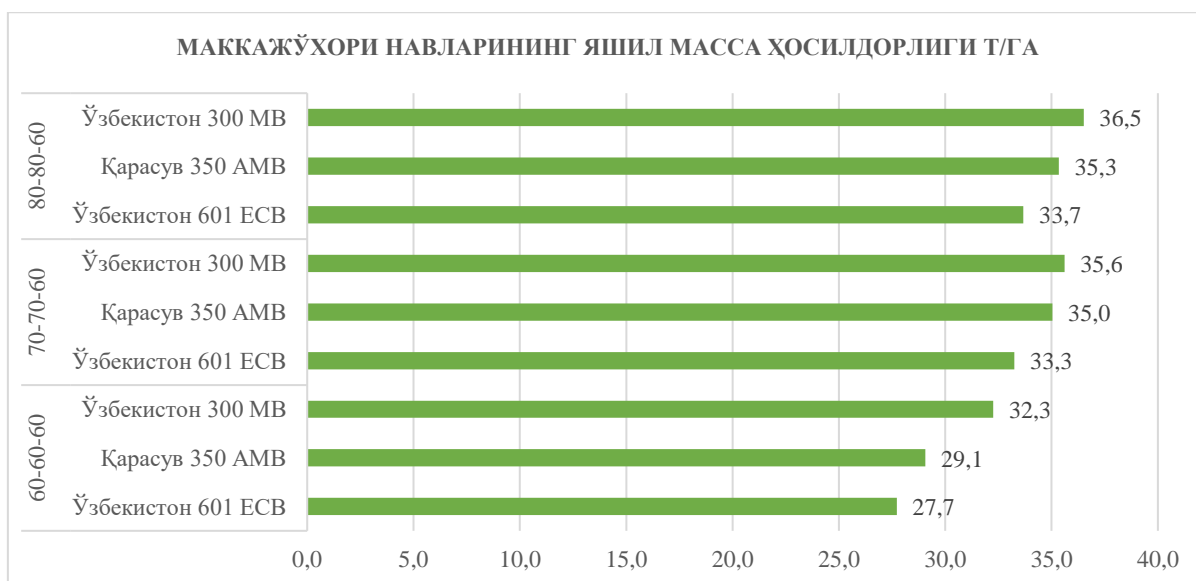


Figure 4.8.4. Effect of corn varieties planted as a repeated crop on green mass yield c/ha depending on the irrigation regime.

The indicators of the green mass yield of corn varieties were observed in the order of irrigation of 80-80-60% soil moisture before irrigation compared to field capacity. However, since the main goal in the experiment was grain yield, it was observed that the higher irrigation regime resulted in more stem growth and higher green mass of the plants, considering the grain yield in the 70-70-60% irrigation regime.

Conclusion. In general, it can be concluded from the obtained results that in the conditions of moderately saline, meadow-alluvial soils, irrigation of 80-80-60% of pre-irrigation soil moisture compared to field capacity of corn varieties contributes to more accumulation of green mass (stems, leaves). However, taking into account soil properties and grain yield, the optimal irrigation method should be 70-70-60%.

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