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REQUIRED EFFECTIVE TEMPERATURE SUM FOR SUNFLOWER VARIETIES

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Abstract

The article experimentally revealed that the Dilbar variety of oil sunflower receives more effective temperature during the growing season than the Buzuluk and Zarrin varieties. In the variants with a sowing norm of 50, 60 and 70 thousand seeds/ha, it was observed that the temperature was higher when sowing on April 15 than when sowing on April 1 and May 1, while in the variant with a sowing norm of 80 thousand seeds/ha, on the contrary, a lower temperature was required. The Zarrin variety was distinguished from the experimental varieties by its early ripening and shorter days for transition from phase to phase. However, the pattern of higher effective temperature requirements was preserved in the variants with a higher sowing norm compared to the variants with a lower sowing norm.

Keywords: Sunflower, oil, norm, date, variety, effective, temperature, phase, quantity.

INTRODUCTION

In modern world agriculture, sunflower ranks fifth in terms of the total yield of the main oilseed crops. The share of sunflower in the total world oilseed production is only 7%, while the share of soybeans is about 57%, cotton and rapeseed - 12%, peanuts - about 8%, and the remaining 16% is accounted for by rapeseed, mustard, flax, rye, etc. This ratio has been maintained for several

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decades, but the total volume of oilseed production has increased significantly [8]. Due to the high heat requirements of sunflower seeds during germination, it is considered a medium-term crop. Its seeds begin to germinate when the soil temperature is +4-5°C, but at this temperature the germination process is very slow (more than 20 days). Rapid germination of seeds and rapid and uniform germination (by the 12-14th day) are observed when the sowing layer of the soil is steadily warmed up to +10-12°C and the sum of active temperatures accumulates around 117-120°C. Sunflower plants can withstand short-term frosts down to minus 4-5°C during the germination period [1, 2, 3, 4, 5, 6].

MATERIALS AND METHODS

The scientific research work was carried out in 2022 at the experimental scientific research and educational experimental farm of Tashkent State Agrarian University.

The soil of the experimental farm is a typical non-saline gray soil that has been irrigated since ancient times. This soil contains 1.187-0.972% humus, about 0.112-0.098% nitrogen, about 0.181-0.169% phosphorus and about 1.33-1.21% potassium. The mobile forms of nutrients in the experimental field are $N–NO_3$ - 16.1-13.7 mg/kg, P_2O_5 - 45.4-38.9 mg/kg and K_2O - 374.5-358.3 mg/kg.

In the field experiment, the sunflower varieties Dilbar, Buzuluk and Zarrin were planted in 36 variants, three replications. Each plot had an area of 56 m^2, of which the calculated area was 28 m^2. Sunflower varieties were sown at planting dates of April 1, April 15 and May 1 at planting norms of 50, 60, 70, 80 thousand seeds/ha. Based on the goals and objectives of the experiments, phenological observations and calculations were carried out on the oil sunflower variety.

RESULTS AND DISCUSSION

The effective temperature sum was determined in the growth and development phases of sunflower varieties. Favorable weather conditions were observed for

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the germination of sunflower seeds and uniform germination, and for full germination, the Dilbar and Buzuluk varieties, when planted on April 1, received the same effective temperature, i.e. 166.9°C, even in 4 fields. For the Zarrin variety, a temperature sum of 155.3°C was sufficient. For the Dilbar (st) varieties, when planted on April 15, a temperature sum of 144.7°C was sufficient, while for the Buzuluk and Zarrin variety, a temperature sum of 133.1°C was sufficient. For the Dilbar and Buzuluk varieties, when planted on May 1, a temperature of 158.9°C was required for the full germination phase, while for the Zarrin variety, a temperature of 147.4°C was required.

Since the varieties differed in the transition days from the starling phase to the phase, the effective temperature sums also varied. When the Dilbar (st) variety was planted on April 15, it was found that the low-norm variants required the same temperature from the starling phase to the ripening phase, 176.0, 158.2, 349.3, 431.1, 444.8 °C. In the variants with increased seeding norms for this variety, the starling phase required a higher temperature of 176,0 °C, but in the subsequent phases, on the contrary, a decrease was observed, i.e., effective temperatures of 154.1, 306.0, 409.3 ва 370.6 °C were observed, since the transition phases were accelenormd in the variants with increased seeding norms compared to the variants with low seeding norms. A similar pattern was also observed in the Buzuluk and Zarrin varieties. When the variety was planted on April 15, in the options with a low planting norm, it received useful temperatures of 187.6, 143.1, 364.4, 414.2 ва 421.9°C in the transition phases, while in the options with an increased planting norm, it was demanded 176.6, 136.9, 323.2, 409.3 ва 394.5°C.

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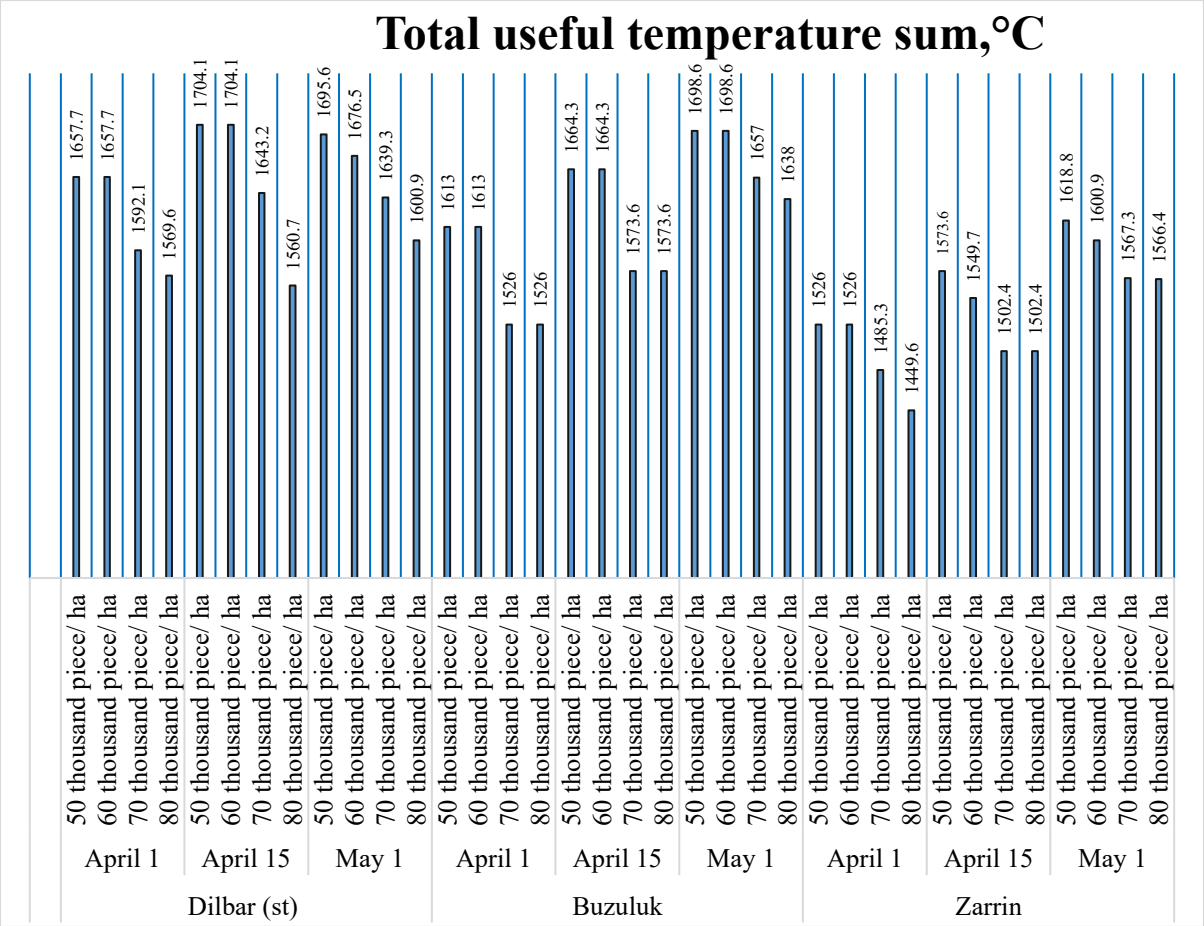

Figure 1

When the Zarrin variety was planted on April 15, in the options with a low planting norm, it received useful temperatures of 166.2, 141.3, 313.4, 403.7 and 415.9°C in the transition phases, while in the options with an increased planting norm, it was 166.2, 141.3, 299.2, 377.6 and 385.0°C. demanded.

The total useful temperature sum of the Dilbar (st) variety was found to decrease in the variants with increased sowing norms, i.e., 1657.7, 1657.7, 1592.1 and 1569.6°C, while it was found that when sowing was carried out on April 15, a higher temperature was required, i.e., 1704.1, 1704.1 1643.2 and 1560.7°C. It can be seen that in the variants with sowing norms of 50, 60 and 70 thousand seeds/ha,

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the temperature was 46.4, 46.4 and 51.1 °C higher than in the variants with sowing norms of 80 thousand seeds/ha, on the contrary, the temperature was 8.9 °C lower. When planted on May 1, the effective temperature sum was average compared to April 1 and April 15, and was 1695.6, 1676.5, 1639.3 ва 1600.9 °C, respectively.

The Buzuluk variety, when planted on April 1, received a temperature of 1613.0 °C in the variants with low planting norms and 1526.0 °C in the variants with high planting norms, while when planted on April 15, it received temperatures of 1664.3°C, 1664.3, 1573.6 and 1573.6 °C. It was found that temperatures of 1698.6 ва 1638.0° °C were sufficient for the rapid ripening of sunflower on May 1.

The Zarrin variety stood out from the experimental varieties in terms of its rapid ripening and the short days of transition from phase to phase. However, in comparison to options with low seeding norm, the rule of higher effective temperature sum was maintained in the options with increased seeding norm. When planted on April 1, temperatures of 1526.0, 1526.0, 1485.3 and 1449.6°C were observed. 1573.6,1549.7, 1502.4 ва 1502.4°C when planted on April 15 and When planted on April 1, temperatures of 1526.0, 1526.0, 1485.3 and 1449.6°C were observed. 1573.6, 1549.7, 1502.4 and 1502.4°C when planted on April 15, and an increase in the total effective temperature was observed when planted on May 1, because the transition phases of sunflower when planted on May 1 correspond to high temperature days of summer. It was found that 1618.0, 1600.9, 1567.3 and 1566.4°C are effective temperatures.

CONCLUSION

The experiment revealed that the Dilbar variety of sunflower receives more effective temperature during the growing season than the Buzuluk and Zarrin varieties. In the variants with a sowing norm of 50, 60 and 70 thousand seeds/ha, it was observed that the temperature was higher when sowing on April 15 than

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when sowing on April 1 and May 1, while in the variant with a sowing norm of 80 thousand seeds/ha, on the contrary, a lower temperature was required. The Zarrin variety was distinguished from the experimental varieties by its early ripening and shorter transition days from phase to phase. However, the pattern of a higher effective temperature requirement in variants with a higher sowing norm than in variants with a lower sowing norm was preserved. In Zarrin variety, compared to April 1 and May 1, it was observed that in the options with low planting rate on April 15, the sum of effective temperature is more required.

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