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TO STUDY THE EFFECT OF THERMAL RESOURCES ON CROP PRODUCTIVITY IN AGRICULTURAL SYSTEMS

Annotation. *The article provides information on the impact of thermal resources on crop yields in agricultural systems. In addition, data on air temperature and precipitation are provided by meteorological stations of the Republic of Uzbekistan.*

Keywords: *weather, temperature, crop yields, agriculture, irrigated land*

In the Republic of Uzbekistan, the geographical conditions, in particular, the need for agro-climatic conditions and resources, which are its leading industries, are gradually increasing in order to achieve high results in a unique way. The main task of the agro-industrial complex is to provide the population of the republic with food and agricultural raw materials. Ensuring food security of the population of the republic is undoubtedly one of the most actual problem.

Over the last 30-40 years, due to changes in climate, environmental conditions and changes in agricultural systems, it has become expedient to prepare a new directory of thermal resources.

Accordingly, the following tasks have been identified:

- Brief report on specific weather, agro-climatic and physical-geographical conditions, climate and agro-climatic zoning in the Republic of Uzbekistan
- calculate the average value of air temperature and precipitation by months by major meteorological stations
- Calculate the sum of the effective air temperature and the steady transition of air temperature from 0°, 5°, 10 °, 15 ° C in spring and autumn
- quantitative assessment of the effects of the last black frost in the spring

In the production practice of agricultural workers, it is important to provide them with the basic agro-climatic, ecological reference materials necessary for stable and high yields of agricultural crops. From thermal resource data, agricultural workers must be able to effectively use the region's thermal resources and adverse weather events during their work. Thermal resources are covered throughout the Republic of Uzbekistan. The best time to plant the seeds is in the soil, when the air temperature is sufficient for the cotton variety, and when the pods are fully open. It is shown that the agro-climatic criteria can be used to assess the condition of crops. Indications for the efficient use of thermal resources have been found.

The selection of plant varieties to be grown in each region, depending on their biological requirements to the external environment and the soil and climatic conditions of the area, is widely used in practice. The optimal time for planting seeds is determined by the soil (air) temperature, which is sufficient for the growth of each plant [1, 2, 3, 4-5].

Table 1 presents changes in air temperature and precipitation at meteorological stations located on the territory of the Republic of Uzbekistan. Using the data of meteorological stations located in the regions of the country, it

is possible to determine the values of air temperature required for crop yields from the thermal resources of the region.

The plant grows well only if it has enough nutrients and dissolved salt in the soil. The part of the soil that provides the plants is mainly the top layer of pores, which nourishes the plants and provides them with water [2, 3, 5, 6].

Table 1. Changes in air temperature and precipitation according to meteorological stations

Stations		Nukus	Urgench	Bukhara	Navoi	Jizzakh	Yangiyer	Karshi	Namangan
Month	1	-4,9/ 3,4	-3,4/ 1,6	0,1/ 6,4	0,87/ 9,8	0,27/ 5,4	0,63/ 13,1	1,4/ 12	-1,5/ 6
	2	-3,5/ 2,9	-1,6/ 2,4	2,6/ 5,9	3/ 9,6	2/ 15,5	2,43/ 13	3,9/ 10,5	1,3/ 7
	3	4,1/ 5,5	5,6/ 5,6	8,7/ 9,9	8,7/ 16,1	8,4/ 23	9/ 18,4	9,8/ 19,9	8,7/ 9
	4	14/ 6,4	14,8/ 6,4	16,6/ 7,7	16,1/ 11,2	15,7/ 20,7	16,3/ 20,8	16,9/ 12	16,5/ 7,8
	5	21/ 4	22/ 3,2	22,5/ 2,9	21,8/ 5,2	21,2/ 9,9	21,9/ 10,4	23/ 5,7	21,8/ 5,7
	6	26,4/ 1,3	27/ 1,1	23,9/ 0,33	23,5/ 0,43	26,4/ 1,73	27/ 1,9	28,4/ 0,4	26/ 2,4
	7	28,7/ 1,2	29/ 0,7	28,6/ 0,37	28,7/ 0,57	28,1/ 1,23	28,5/ 0,9	30,5/ 0,2	27,5/ 2,2
	8	26/ 0,7	25,5/ 0,26	26/ 0,1	26/ 0,07	25,7/ 0,43	26,1/ 0,53	27,9/ 0,03	25,3/ 0,7
	9	19/ 1	19,4/ 0,5	20,2/ 0,17	19,9/ 0,2	20,4/ 1,33	20,7/ 1,5	21,7/ 0,3	20,3/ 0,7
	10	10,7/ 2,9	11,3/ 1,9	13,1/ 1,6	12,5/ 2,4	13,6/ 10	14,1/ 9,2	14,7/ 3,7	13,5/ 5,6
	11	4,1/ 3,5	4,9/ 2,5	7,3/ 4	7,9/ 5,5	7,23/ 11	8,17/ 9,2	8,8/ 6,1	6,7/ 4,7
	12	-1,7/ 4,5	-1,2/ 3,6	2,5/ 6,3	3,57/ 8,83	2,83/ 15,6	3,33/ 11	4,1/ 10,4	1,03/ 7

Note: The values in the table should be understood as follows. Temperature in the image of the fraction, the amount of precipitation in the denominator, tºC / S, mm

Based on the data in the above tables, it is possible to determine the dates of sowing of agricultural crops in the territory of the Republic of Uzbekistan, taking into account the regime of air and soil temperatures. It is a well-known fact that every agricultural crop needs a certain amount of heat and moisture according to its biological parameters.

The main crops for irrigated lands in the Republic of Uzbekistan are cotton, non-irrigated (arable) lands - cereal crops [7]. The change in the temperature of the upper part of the atmosphere during the day and night is determined by the temperature data at a height of 2 m. Temperature is measured with various thermometers.

The nature of the change in air temperature is determined by its extremums, i.e. more and less values (maximum and minimum). The difference between these values is called the amplitude (change in air temperature). The regularity of daily and annual changes in air temperature is determined by averaging the results of long-term observations. It is associated with periodic oscillations. Irregular disturbances of daily and annual walks may result in the inflow of cold or warm air masses, the temperature does not decrease at night, but instead rises, or the inflow of cold air masses may be lower during the day than in the previous day.

A change in soil temperature overnight is called a daily change. Daily temperature changes usually have a maximum and a minimum. The minimum surface temperature is observed on sunny days before sunrise, ie the radiation balance is negative and the heat exchange between the air and the soil is insignificant. Due to changes in the radiation balance value with sunrise, the soil surface temperature increases, especially on clear days. The maximum temperature is observed at 13 o'clock, after which it decreases until the morning minimum.

Meteorological stations have been monitoring air, soil surface and soil temperatures at various depths for many years. The processing of this data

allows us to establish the laws of daily and annual changes in air and soil surface temperature overnight.

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