ANALYSIS OF THE IRRIGATION RATE WITH THE MODERN METHOD BASED ON THE CROPWAT PROGRAM. (IN THE EXAMPLE OF SOYA PLANT GROWN IN BLACK SOILS).

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Annotation

Currently, the processes of agricultural development are underway. Based on this, some electronic programs have been developed for the development and scientific justification of crop irrigation norms. CropWAT can be included among such programs.

CropWAT is a software designed to calculate the amount of water needed to irrigate these crops. The calculation strategy is based on two references from the same developer:

1. Provides a procedure for calculating the effective amount of crop water.

2. It is a program that predicts the amount of evaporation of plants and the expected yield for the given amount of water.

Key words

Climate, Osadki, Kultura, TKV, Graph, Schema razmer, Kultur, Schema, FAO, CropWAT.

INTRODUCTION.

For the CropWAT program to work effectively and correctly, the user must enter data on evapotranspiration (the amount of water evaporated from the soil and lost to the atmosphere by plants).

Data can be entered from the data interface on the left side of the main window (Klimat.Eto - climatic factors, Osadki - precipitation, Kultura - culture "for a certain type of plant", Pochva - soil" suitable for the studied area. ", TKV - runs an analysis graph based on the data entered before it, Graph - the main program menu that processes data, Schema razm.Kultur - a part of the crop placement scheme, Schema - the last program menu that processes the final irrigation scheme) can be entered manually by typing. Therefore, users will need to monitor weather changes

and obtain information from the meteorological station on other parameters such as climate (temperature, humidity, wind, sun, etc.), as well as monthly precipitation and soil properties [1-5].

After these forms are filled, the program informs about the amount of water required and the irrigation schedule in the window "Water requirements for plants" in the section "Scheme - the last program menu that handles the final irrigation scheme".

Downloading the program: The program is developed by the international organization FAO, to download the program, search "CropWAT" from your Google account and start downloading. The program is downloaded from the website in ZIP format to a personal computer or to a location specified by you. After that, open the file and press the "Next" button from the opened menu, and a new window will open, click "Next" from this window as well. This process is repeated several times and the installation is completed. The program tab is copied to the working window, and at the end, the program becomes active on the personal computer.

The purpose of the work: the effect of irrigation water on the yield of winter wheat in the conditions of irrigated meadow soils of Fergana region and the development of the irrigation scheme based on the CropWAT electronic program, taking into account climate factors.

Research object: Black soils of the territory of Ukraine.

Research subject: soybean plant.

THE MAIN PART.

When the applications in the program menu are being filled, they are required to be filled in sequence. The data entered will be used in processing for key menus [6-10].

Climate. Eto - In the upper part of the program, the country is entered, and Uzbekistan is entered in the part. Abs.vysota - absolute height, the absolute height of the studied area, that is, Ukraine (Krasnodar) above the sea level, is written, for example, 3 m. Shirota and Dolgota - latitude and longitude, geoposition of the area is written on the graph. For example, Shirota 45,030, Dolgota 39,150. Station - the name of the region is entered, for example, Ukraine.

The following information is required:

1. Min.temp - minimum temperature,
2. Max.temp - maximum temperature,
3. Vlajnost - humidity,
4. Veter - wind,

5. Soln.svet - sunny days,

6. Rad - radiation,

7. ETo - evatotranspiration (evaporation of moisture over the soil).

Data in columns 6-7 will be automatically processed and displayed.

If you want to complete the data processing process here, enter the prepared data into the Parameter setting section and select the partitioned file section from here, and from here select the computer's D drive from the bottom and click the OK button. Then enter the file section of the main menu, give a name, select the specified location (D disk) and click the Sochranit button to finish saving.

In the same way, you can change the data storage location in the rest of the menus.

If you do not have enough information to fill in the information in the program menus, then you can download the CLIMWAT program from the Internet and from there you can get it online. centers are marked as dots. The desired point is selected, and from the top menu, go to Stations and select the storage location. And the data will be downloaded by pressing the Export PEN and Cli file button. To transfer the downloaded data to the working window of the CropWAT program's Klimat.Eto menu, go to the data section of the Otkrit section from above, select the file downloaded from the CLIMWAT program, click the Otkrit button, and the data will be downloaded to the working window.

Pic. 1

To make the entered data into a diagram, click on the Diagram part of the above menus, the diagram will be processed, and you can select and change the quality indicators by placing a checkmark in the part below [11-15].
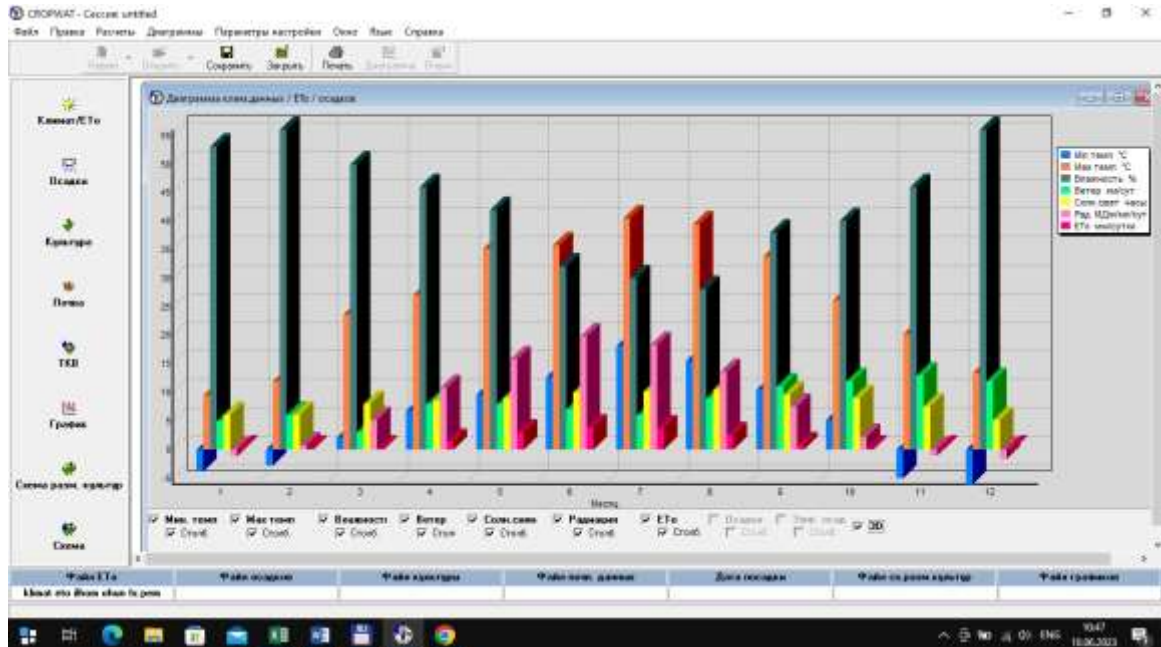

Pic. 2

Then, after returning to the main menu, in the File menu, select the disk D located at the bottom of the climate section, write the reference name, press the Sochranit button and save the file. The linear slides of the menus located on the left side of the program are not all in a single state, that is, the menu information you have entered is stored in a separate slide view, the slides of the other menus are not saved. Therefore, it is better to complete the data in one input and get the result.

The diagram part is also entered in the File menu and the slide is saved separately, the slide format is saved in the selected location in BMP mode.

To save all the data entered in the table together, go to the File menu and select the location of Sochranit cessiyu kak and save it.

Precipitation: in this part, depending on the amount of rain, the effective impact of the amount of rain is evaluated and a coefficient is worked out. This too is automatically processed as data is entered. Ukraine is written on the part of the station. After entering the data into the table, enter the Sochranit menu, select Curn 86 cm and save it [16-20].
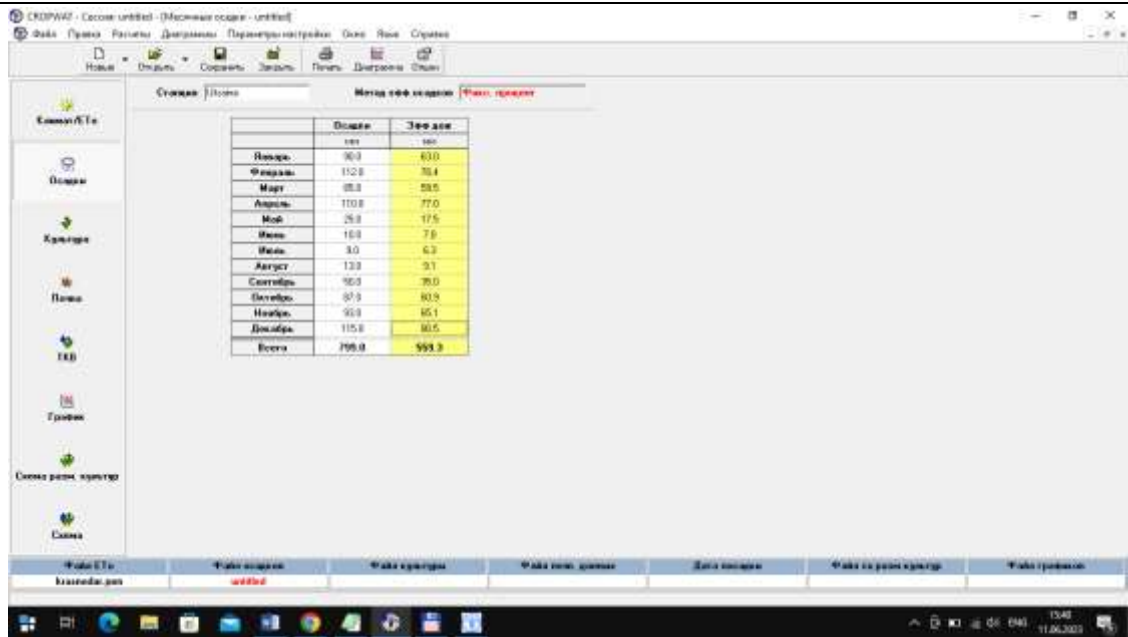
Pic. 3

For this, from the top menu of the CopWAT program, enter the Options section, write 70% in the Fixed percentage field from the top menu, and press the OK button.
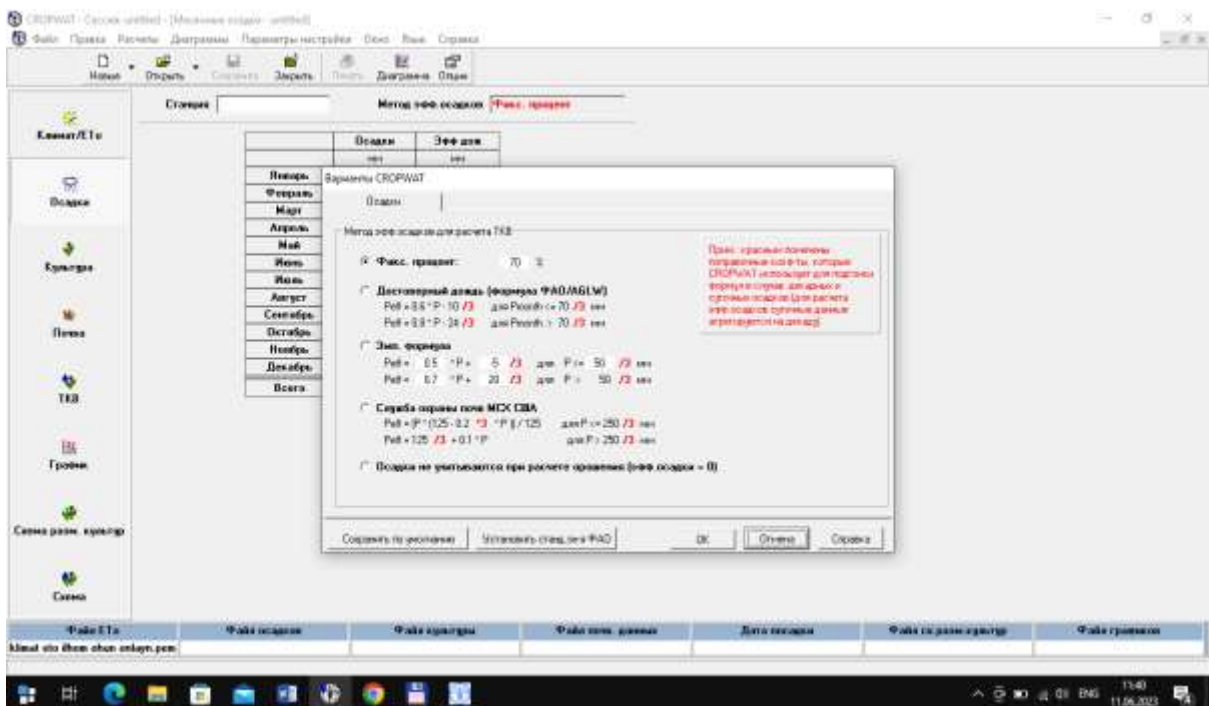
Pic. 4

In order to display the entered data in the form of a diagram, the Diagram part is selected while standing in this part, and the diagram appears. In this case, the appearance of the diagram can be adjusted by putting a check mark on the lower part. Before that, it is necessary to exit the diagram created in the previous menu with the x button.

Entered and processed diagrams can be moved to the lower part of the program window, where the diagram and entered data are placed separately - separately at the bottom of the screen and the data is saved with the same name as saved in the previous menu.
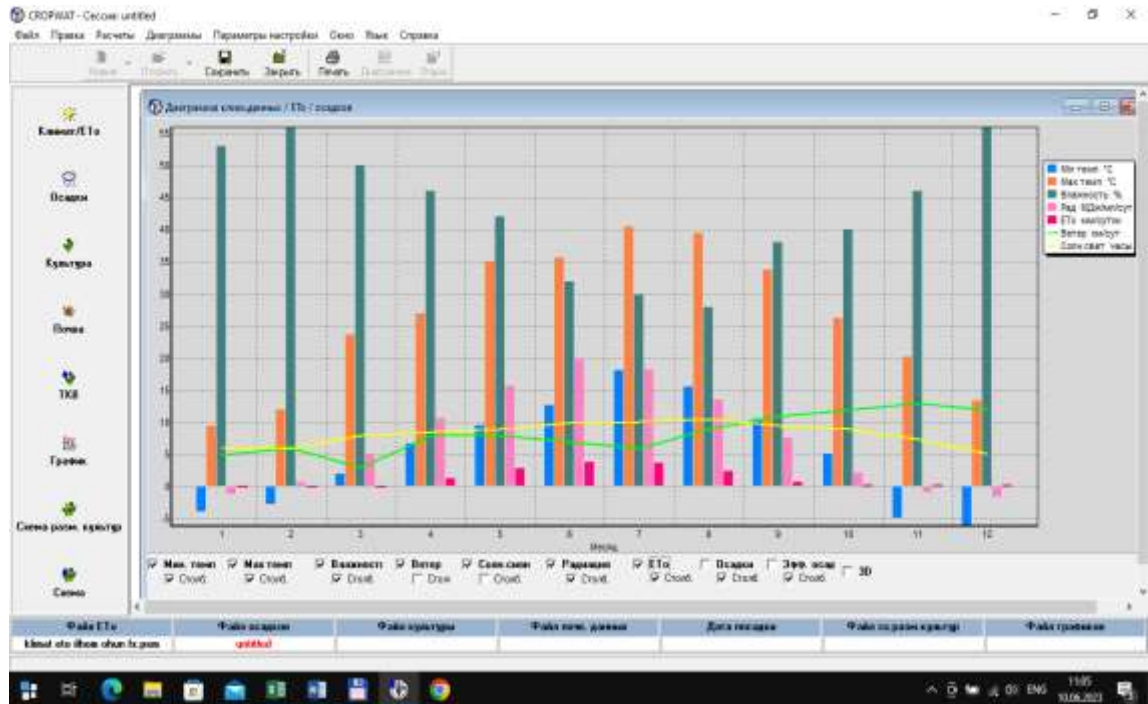
Pic. 5

Culture: in this menu of the program, it is required to enter the following information.

The name of the selected plant is written in the "Culture" section, for example, "Soya" and the watering time is entered [21-25]. Data posadki - planting time is automatically filled in with the working time in the schedule.

1. Stage dney - stages of plant development

a) nachalnaya - the beginning,

b) razvitiya - development,

s) ser. season - mid-season development

d) conets season - development stages at the end of the season are included.

Then enter the CLIMWAT program and select Crop information from this place, and if you enter Crop Description and Climate, information about the growth stages of the selected plant will be given. You write in the first cell of the sign. 1.15 is written in the second cell. Then 0.30 is written in the first cell of the Glubina corney row and 1.00 in the second cell. Otherwise, in order to automatically load the data, in the Culture section, press the Open button from the

above menus, enter the folder called FAO, select your own plant shade, and press the ENTER button, and the data will be automatically filled.
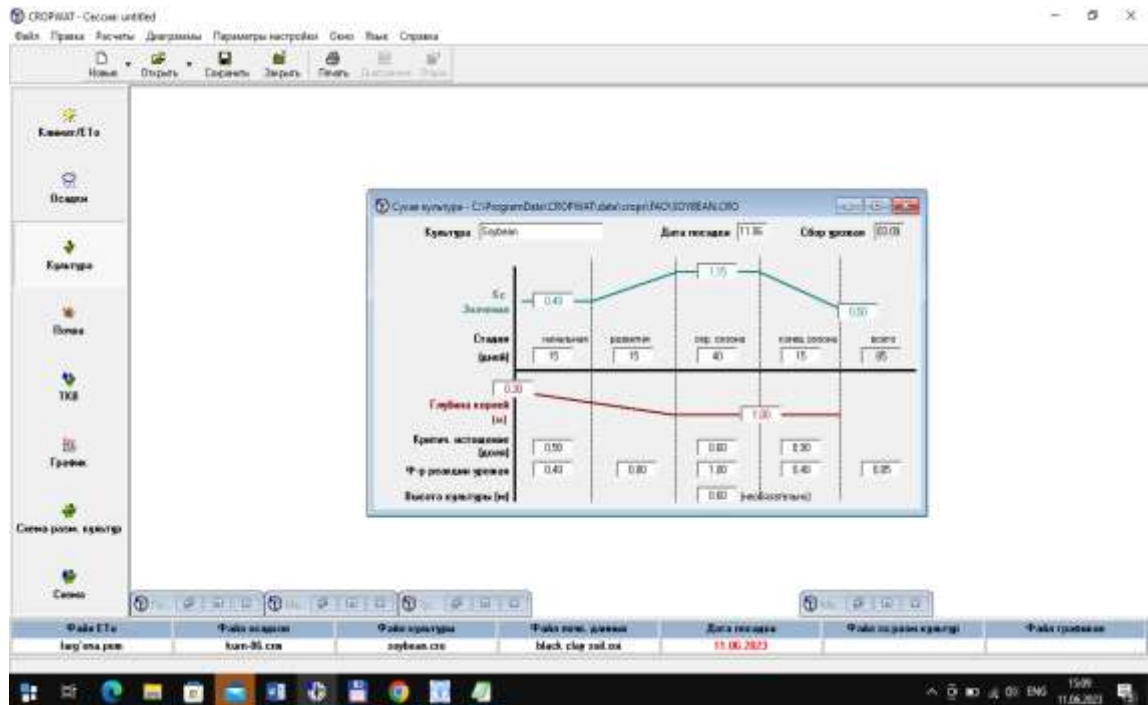
Pic. 6

The following must be filled in when entering the information in the Field: section

a) Obshaya dostup pochv vlaga (FC-WP) - total total moisture in the soil,

b) Maximum rate of infiltration, osadkov - maximum infiltration due to precipitation,

s) Max glubina cornea - maximum root depth,

d) Nachalnoe istoshenia pochv. Moisture (% Tam) - reduction of initial moisture in the soil,

e) Nachalnoe dostavnaya pochv. Moisture is the initial moisture present in the soil.

In order to automatically enter data into this section, select the desired type of soil, for example, black soil, from the Otkrit menu located at the top of the program, and press the ENTER button, as a result, the data will be entered automatically. If the selected soil does not exist, the information in the next sections will not be processed. To copy data to exl format, click on the table with the right mouse button and you can copy and paste it into an exl file [1-3].

In the TKV: section, we can see the main analysis results, that is, the entered data was reprocessed by the program as follows. Osadki St. Decades are divided

for the months of June, July, August, and September, that is, 1-2-3. Phases are the stages of plant development in the next row

a) nachalnaya - the beginning,

b) razvitiya - development,

s) ser. season - mid-season development

d) konets season - developments at the end of the season are shown.

In the next Ks.coeff column, the coefficients for each stage of development are produced. In the columns ETc mm/day and ETc mm/dec, the evapotranspiration values are calculated by 1 day and decade from the surface of the earth. After that, in the Eff.doj column, the amount of precipitation falling on the land area per decade is processed. In the Treb.Or section, the amount spent on evaporation (evatotranspiration) is subtracted from the amount of precipitation per decade, and the amount of real moisture remaining in the soil is automatically processed as a decade.
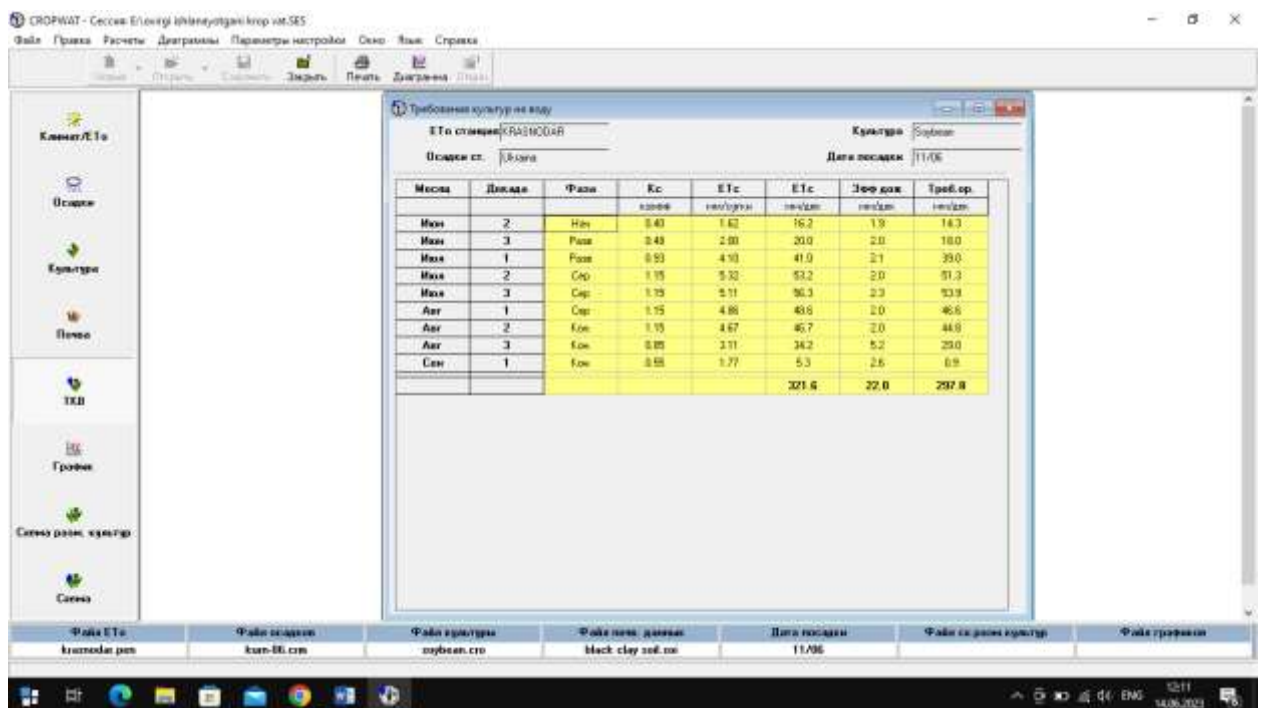
Pic. 7

The following information is processed in the Graphic: part: graphic irrigation - irrigation schedule, water balance soil moisture - daily moisture balance of the soil, information can be obtained in both cases by specifying these two data [4-8].

The information in the table below is displayed in a processed state.

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