Mini Review

iMedPub Journals
www.imedpub.com

Journal of Plant Sciences and Agricultural Research

2021
Vol. 5 No. 2: 51

Remote Automated Controlled Irrigation Systems and the Principles of Their Functioning in the Conditions of Azerbaijan

Aliev ZH*

Department of Soil Science, ANAS Institute Zoology, Baku City, Azerbaijan

*Corresponding author: ZH Aliyev, Department of Soil Science, ANAS Institute Zoology, Baku City, Azerbaijan, E-mail: zakirakademik@mail.ru

Received date: February 03, 2021; **Accepted date:** February 17, 2021; **Published date:** February 24, 2021

Citation: Aliev ZH (2021) Remote Automated Controlled Irrigation Systems and the Principles of Their Functioning in the Conditions of Azerbaijan. J Plant Sci Agri Res.Vol.5 No.2: 51.

Abstract

This article examines the current state of soil and water resources, farmland Azerbaijan Republic, the problem of progressive water and wind soil degradation, the need for the organization of agriculture, taking into account the introduction of automated control systems for irrigation using water-saving technology and hardware equipment in it, the study of the characteristics a and analysis of experience implementing measures to stabilize ecological and drainage system of agriculture in conditions of insufficient moisture areas in the country, as well as basic aspects of the development of environmental reclamation approach balanced, rational use of a particular system of crop rotation and crop taking into account the requirements of economic development and environmental management.

Keywords: Irrigation; Technology; Degradation; Automated management of low-intensity zones; Agriculture

Introduction

The main directions of the economic and social development of the republic are the intensification of agricultural production. Irrigation is a powerful means of intensifying agricultural production in the conditions of its specialization. In areas of insufficient moisture (especially characteristic of mountainous areas), irrigation is one of the decisive factors in the cultivation of high and stable crop yields. To this end, it is necessary to develop new technical solutions and introduce automated low-intensity irrigation systems for agricultural crops that meet the requirements of the environment and protect their habitat, which allows improving the ecological status of irrigated land, reducing water consumption per unit and increasing yields crops on the irrigated field.

Literature Review

Irrigated soils in Azerbaijan cover 145 thousand hectares. It is believed that the use of automation also applies to factors directly affecting the entrainment of crop yields and increasing the productivity of each hectare of arable land and agricultural land with minimal outlays of labor and resources [1-3]. Automated irrigation increases the efficiency of all the intensification factors such as chemicalization, complex mechanization, renewal grade, intensive technology, etc. It allows creating large zones of guaranteed crop production.

The object of the study is to study and create methods of correct regulation of water consumption and plant nutrition by irrigation, depending on the weather conditions [4]. To this end, we have developed and implemented in the design of systems for automated control of low-intensity irrigation systems based on a self-oscillating micro-oxidizer successfully passed the resource test, tested on selected soils under the orchard, in the Guba-Khachmas zone on the Shahdag foothills located above the sea level at 600 meters with a slope of the terrain [5,6]. (See Principal scheme of a pulse sprinkler system of self-oscillating action with automated control **Figure 1**).

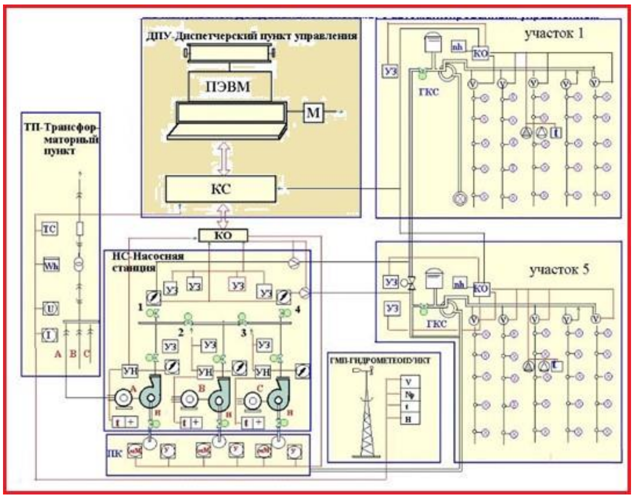

Figure 1: Schematic diagram of a pulse sprinkler system of self-oscillating action with automated control.

Discussion

So, for the operational control of weather conditions in the region, which are necessary for solving the planning and operational management of irrigation of crop fields, metering sensors with transducers for telemetric counting of the main parameters are installed at the local hydro meteorological point: a) wind speed -V analog signal (TIT) with a period of recording the parameter values in a cycle of 30 minutes. b) air

© Copyright iMedPub | This article is available from: https://www.imedpub.com/plant-sciences-and-agricultural-research/

temperature -tv, analogue signal (TIT) with a period of recording the parameter values in a cycle of 30 min. c) air humidity -Wв, analogue signal with a period of recording the parameter values in a cycle of 30 min. The values of the parameters in the telemetry code are calculated by the intelligent object controller (KO) installed in the transformer station through the radio channel communicating with the transducer sensors.

In the CC, the measured telemetry codes are processed by the primary processing, averaging and stored in the RAM, which are stored before they are counted by the communication controller (CS) installed in the operational control room of the technological process (ASMO)-operator. To monitor and manage the power supply to ASMO facilities and to account for electricity consumption at the transformer station (TP) (see the structural and principle diagram of the APCS of irrigation), transducer sensors are installed: a) measuring the voltage at the input in the TP-U (analog signal (TIT); b) load measurement of consumers -I U (analog signal (TIT); c) Accounting for electricity consumption -Wh (discrete integrated signal-TII; d) control of the position of the switches (switching-off of electrical consumers) -SC (discrete signal TCC position).

The report of the parameter values in the telemetry code is carried out by the intelligent object controller (CO) over the local wire communication channels and, after their initial processing and averaging, is recorded in the operative memory. For monitoring and control of the technological process of the water intake, sludge (treatment facilities) and pumping station water in pipelines) are installed sensors-converters specified in the structural-functional scheme: a) turbidity of water in sedimentation tanks-M (analog si nal TIT readable in a cycle of 30 min); b) the water level in the sedimentation chambers-H (analog signal TIT, read in the cycle 30 min); c) water pressure-P, installed on pumps, collection and distribution manifolds (analogue signal TIT, read in a cycle of 30 minutes); d) measurement of load of electric motors -I (analogue signal TIT, read in cycle 30 min); e) positions of the gate valves-PZ (discrete TCC signal, read in cycle 1 s); f) the positions of the power switches (Discrete signal TCC, read in cycle 1 s) g) alarm-AS (discrete signal TCA, read in cycle 1 s, priority), h) measurement of water flow, supplied by pumps and in the distribution pipeline -Q (integrated signal TII, processed in a cycle of 1 hour). Monitoring of soil condition and management of the irrigation technological process is carried out according to individual irrigation fields on the basis of measurements of agrophysical and technological parameters by transducer sensors: soil moisture VLP- (analogue signal TIT with recording in a cycle of 30 min) b) evaporation of water from the soil surface-Isp-(analogue signal TIT with recording in the cycle of 30 min) c) soil temperature (analogue signal TIT with recording in the cycle of 30 min) d) water flow rate for irrigation through the distribution pipeline of the section-Q-(integrated beep recording in a cycle of 30 minutes) e) switching on the GCS -discrete signal readable in a cycle of 30 s, e) the position of the switching gate- (discrete position signal TCC-reading cycle 30 s).

The signal in the telemetry code is transmitted by the intelligent object field controller via radio channels and after their initial processing and averaging by the processor is written into ram. Entering operational data into the computer and forming a database (OBD) The data recorded in the operative memory of the object controllers (KO) is counted by the program m but the radio channels and wired communication connection controller (CC) connected to a computer control station (AP) (see a schematic diagram of a low-intensity irrigation system with automated control), according to a specified schedule, and written to its operational memory in the structure of the telemetry file (see Information Support).

The computer uses the exchange programs to count the data from the RAM of the coprocessor, recodes them and writes them to the operational database, from which it displays them in real time to display on the mimics, and after linearization and averaging, the data for their program codes are written to the storage bases, the cat structures They are listed in the information support, and this forms the Bank of Data of the ASMO task complex. Information flows of the automated low-intensity irrigation system (ASMO). Before recording to the Data Bank, the flow of measurement data is analyzed according to predetermined algorithms and, when analyzing results having deviations from the settings specified in the regulations, is recorded in the operational control database (OBU) by the technological process. The operational base of program management, but according to the cycle specified in the regulations, is counted by the control module in the technological directions and in the presence of deviations in the data records forms direction of the control signal to the required executive body. Organization of data collection and transmission is via Internet.

Terms of Data Exchange

Data exchange on the operation of the irrigation system is carried out through the World Wide Web. For this, it is necessary to connect the modem through a computer to the telephone network and obtain the right to access the Internet from the provider. This condition extends to each subscriber. If these conditions are met, the "Center's computer can connect to computers in the irrigation areas of the regions of Azerbaijan and other countries." The site of the irrigation system is being organized, visitors of which will see: the latest data on the state of the system, interactive pages created using PHP technology, and the real-time exchange of data and messages. With the help of Skype 3, users can talk over the phone and when using cameras to see each other, and with streaming video programs to review the state of the site. When instrumental parameter measurements, it is necessary to take into account the available scatter of the measured values. To specify the calculation conditions, the values of the required conditionally variable variables are recorded in the task for solving the problems (see ZADANIE_3 in the information support). By determining the value of the initial (initial) soil moisture, the moisture reserve deficit task solutions are recorded in the output document DOC_3.

Conclusion

The found values of the parameters-the humidity for a given date BETA_tau or the moisture reserves for a given date W (tau) for each section of the field are recorded in the output document DOC.3, see the layout of the output documents "Burst of moisture over irrigation fields". After determining the moisture content of BETA_tau or the moisture reserve in the soil W (tau), a moisture deficit or a moisture reserve in the soil is determined. The results of the research reveal the possibilities for an operative solution of the complex problems of the operational determination of agro-meliorative parameters.

References

1. Esposito K, Chiodini P, Colao A, Lenzi A, Giugliano D (2012) Metabolic syndrome and risk of cancer: A systematic review and meta-analysis. Diabetes Care 35: 2402-2411.
2. Esposito K, Ciardiello F, Giugliano D (2014) Unhealthy diets: A common soil for the association of metabolic syndrome and cancer. Endocrine 46: 39-42.
3. Cowey S, Hardy RW (2006) The metabolic syndrome: A high-risk state for cancer? Am J Pathol 169: 1505-1522.
4. Hosios AM, Hecht VC, Danai LV, Johnson MO, Rathmell JC, et al. (2016) Amino acids rather than glucose account for the majority of cell mass in proliferating mammalian cells. Dev Cell 36: 540-549.
5. Locasale JW, Grassian AR, Melman T, Lyssiotis CA, Mattaini KR, et al. (2011) Phosphoglycerate dehydrogenase diverts glycolytic flux and contributes to oncogenesis. Nat Genet 43: 869-874.
6. Ying H, Kimmelman AC, Lyssiotis CA, Hua S, Chu GC, et al. (2012) Oncogenic kras maintains pancreatic tumors through regulation of anabolic glucose metabolism. Cell 149: 656-670.