



# IMPROVEMENT OF WATER ACCOUNTING FOR IRRIGATION SYSTEMS

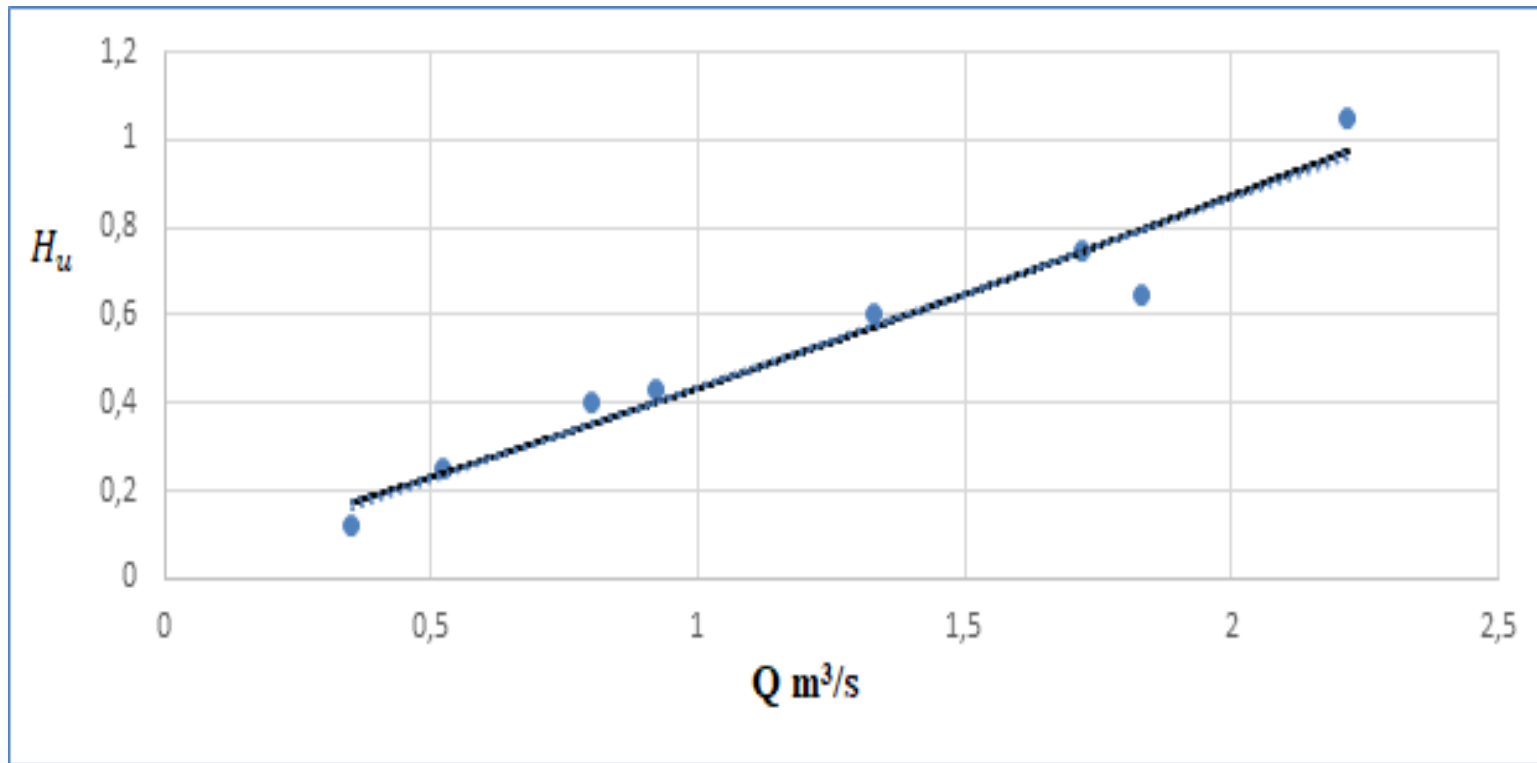
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- Substantiated use of water metering devices which works with hydraulic energy for open canals of farm irrigation systems. Verified the error in measuring water flow. In addition, the article provides an analysis of the water metering in main canals, and tested possibility of using in hydraulic structures. In modern conditions of agricultural development water measuring plays special role is assigned to hydro-reclamation, as one of the main factors that guarantee high stable yields of agricultural crops. To control the consumption of water in open canals of irrigation systems, mobile and stationary gauging stations are used - water metering points.

In this case, the channels have the following hydraulic and hydrometric features:

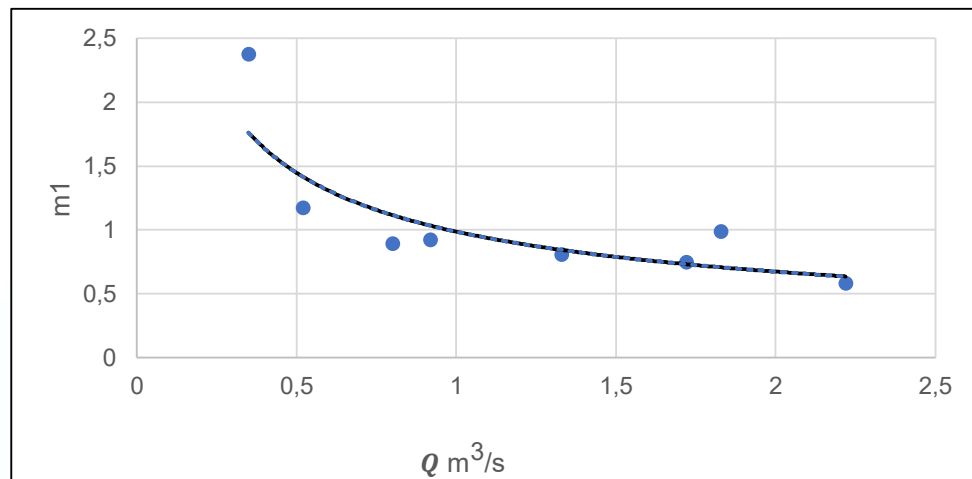
1. There are no water-measuring structures on irrigation systems, and calibration of the structures on the canals, as a rule, does not give satisfactory results, since it is difficult to judge the costs when the canals operate in retaining modes by the installed rails in the pits;
2. Determination of water consumption in canals is carried out using hydrometric rotors, which is rather laborious and not promptly, information on costs comes with a great delay from need;
3. On low-order canals, water discharge, as a rule, is not determined at all.

To calibrate the hydraulic structures of the main canal, the relationship between the flow of water and the depth above the threshold was made (Figure 1).

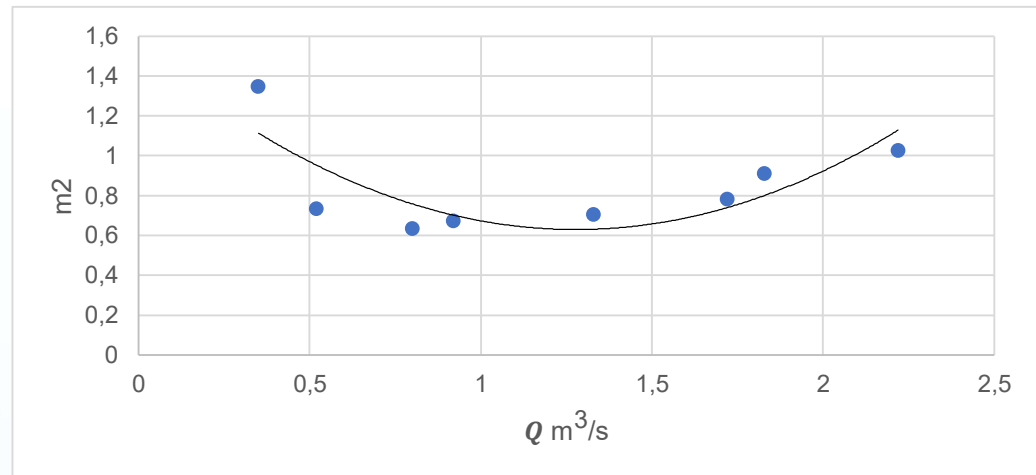


- **Figure 1.** Dependence of water discharge and water depth above the sill in the upper pool

If, after checking, no dependence in the change in  $m$  about one of the indicated values can be established, then, obviously, gross errors were made during field measurements or the structure is operating in unfavorable conditions (Fig. 2, 3). In the first case, the calibration must be repeated; in the second, it is necessary to refuse to meter water using this structure



**Figure. 2.** Dependence of  $Q$  and  $m$  at free flow



**Figure. 3.** Dependence of  $Q$  and  $m$  for a flooded outflow

- 1. Water metering devices should be simple in design, resistant to weathering and work reliably, should not require special highly qualified training of service personnel and significant time spent on hydrometric works, which is very important for private water use;
- 2. Irrigation systems, as a rule, do not have power supply, therefore, it is advisable to use water-measuring devices operating on hydraulic energy;
- 3. The use of water-measuring devices should not change the operating hydraulic regime in the canals, stably fit into the technological process of water distribution;
- 4. The measurement error of water metering devices on canals of irrigation systems should be no more than 4% during water metering.



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