Spectrum Journal of Innovation, Reforms and Development
Volume 28, June - 2024 | ISSN (E): 2751-1731
Website: www.sjird.journalspark.org

FIELD WET CAPACITY IN THE SOIL

Shaymanov Sharofiddin Quvondiq o'g'li
Termiz muhandislik texnologiya instituti erkin tadqiqotchisi

Butayarov Abduqodir Tuxtayevich
Termiz muhandislik – texnologiya instituti dotsenti
Manzil: 100028, Termiz shaxar I. Karimov ko'chasi 288 uy

Abstract
At every point in the world, there are unique climatic conditions and glabal water problems. Due to changes in the contingent climate, there is a shortage of available resources, educational conditions, and various waterfalls. (Matthew 24:14; 28:19, 20) Therefore, the use of transparency technologies to irrigate agricultural crops is one of the most complex problems of our day. Before irrigation, the CHDNS of the field plays a vital role in its economic development, avoiding excessive costs that add to the properties. On time, the need to irrigate crops in its own way is indicated by the wet capacity of a field.

Keywords: crop, water, chdns, irrigation, climate, resource, soil, humidity, economic transparency, norms, time.

Introduction
Factors affecting irrigation, irrigation, irrigation, irrigation elements, technology and technology include: climatic conditions of landfills; soil and meliorative conditions; geological and hydrogeological conditions; hydrological conditions; economic conditions; types and geographical location of grape varieties; Biological features of the lemon garden from the sup tropical crop type; irrigation methods and techniques of lemon gardening; the level of implementation of advanced agrotechnical measures in lemon cultivation. Water conductivity of the soil is known to be one of the most important physical characteristics of the soil, mainly dependent on the mechanical composition of the soil, the amount of rottenness, the level of the field, and other factors.
Water conductivity of the soil was assessed by two periods: the period of infiltration and filtration. The full mathematical definition of infiltration was given by A.N. Kostyakov. Indicators are recommended for these complex process characteristics:

$$K_1 = K_\phi \cdot t^\alpha, \text{ m/s} \tag{1}$$

here: K_1 - the speed of sweep at the end of the first time unit;
K_ϕ -the specified speed of the sweep, (K-Lesson), m/s;
t - the time when the infiltration ends and the sweep has a specified character, s;
α - an indicator of the level of crooked infiltration;

$$\alpha = \frac{\lg K_t - \lg K_\phi}{\lg t - \lg t_\phi} \tag{2}$$

here: K_t - the speed of the sweep t,

$$K_o = \frac{K_1}{1-\alpha} \text{ m/h;} \quad (3)$$

here: K_o - the average speed of the sweep at the end of the first time unit (in the first minute),

$$K_{cp} = \frac{K_o}{t^{\alpha}} \text{ m/soat} \quad (4)$$

here: K_{cp} - t the average speed during the period.

In logorific coordinates, the sweep curve during infiltration reflects a straight line $\left(K_t = \frac{K_1}{t^{\alpha}}\right)$

$$tgK_t = tgK_1 - \alpha tgt; м/с \quad (5)$$

I.G.Aliev and N.F.Bonchkovsky proposed this formula

$$K_o = K_{cp}(10П)^{\alpha} \text{ m/s} \quad (6)$$

here: $П = 0{,}5^{0{,}1694}$

$$K_{cp} = \frac{K_1 t_1 + K_{\theta} t_2}{t} \text{ m/s} \quad (7)$$

here: K_{cp} -average speed of sweep during the infiltration period;

t_1 - infiltration sweep time, m/s;

t_2 - filtering time, m/s;

The water conductivity of the soil of the experimental area for these methods was determined.

At the end of the first hour at the beginning of the vegetation period on the lighter sand soil of the experimental area, the water absulation rate was 0.05 m/h at the end of the fourth hour, and the filtration coefficient was 0.017 and 0.014 m/h.

The shape and dynamics of the moisture contour. Under the influence of irrigation norms, its size $m_n = q_k / t_{bn}$ is determined by the ratio, that is, the water consumption of the boar q_k depends on the duration of its water supply t_{bn}. At the same time: q_k and t_{bn} the values changed significantly, q_k from 1 l/h to 12-20 l/h, t_{bn} from 1 hour to 12-24 hours. The resulting embryo was allowed to t_{bn} develop in nutrients and then instroped into her wowoe, where it foresged.

To evaluate the parameters of moisture contours in various irrigation mechanisms, an efficiency coefficient was used to evaluate the optimal distribution of moisture in drip irrigation $(Кс)$. The efficiency coefficient $(Кс)$ was determined by the uniformity of the horizontal distribution relative to the vertical distribution of moisture, i.e. the ratio of the height of the moisture contour to its width:

The efficiency coefficient of moisture distribution shows that $Кс$-irrigation increased during the first day after it was carried out, and then for all the studied irrigation standards, its decrease was observed. Thus, in the case of great slowness of watering in drip irrigation, the soils acquired the same elliptical paraboloid shape.

$$V = 0{,}5 \cdot \pi \cdot R^2 \cdot H \quad (8)$$

Here: H -height, m; R^2 - rotation radius, m.
The earth's tilt, rotation, and orbit are all just right to prevent the meltwater could prevent the excesses from freezing over or boiling away.

$$V = 11 \cdot \pi \cdot H \cdot R/3 \qquad (9)$$

Here: H - depth of the soil being moistened, m;

R – the largest radius of soil moisture, m.

The accounting standard for irrigation for a single grape seedling will look like this:

$$m = 10 \cdot F \cdot H \cdot d \cdot (\beta_{HB} - \beta_{nn}) \qquad (10)$$

Here: F – Wetting area of the grape tree, m2.

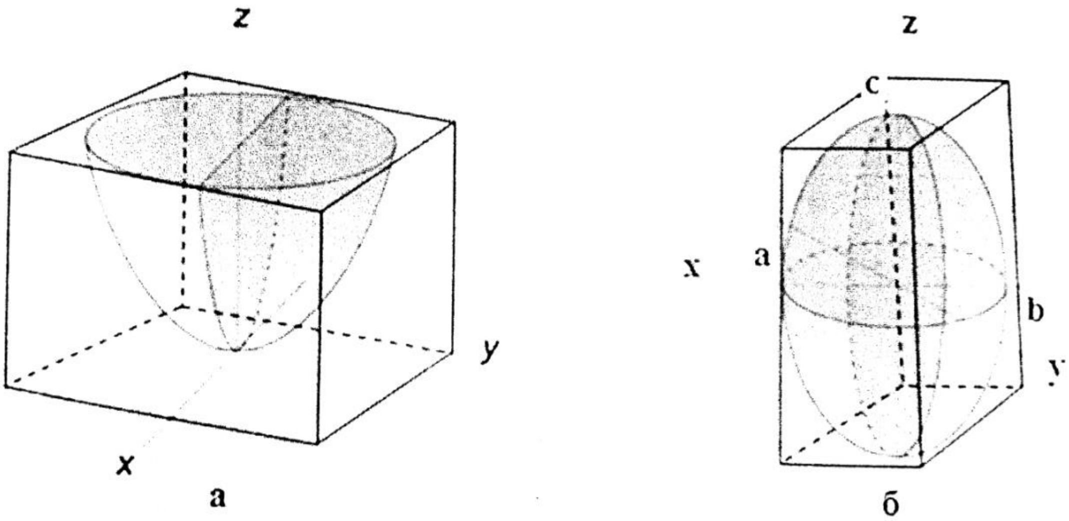

Figure 1. Schematic view of soil moisture container when irrigating

on the basis of a large norm of a-watering;
b- on the basis of a small norm of watering.
The elliptic paraboloid and ellipse height (*N)* were determined by the following formula:

$$H = [(\beta_{HB} - \beta_i)/(\beta_{HB} - \beta_0)][(V_0 - K_\phi)/K_b][1 - \exp(-K_b \cdot t)] + K_\phi \cdot t \qquad (11)$$

here: K_ϕ -soil filtration coefficient in a full saturation state;

β_i - the initial humidity of the soil; %

β_{HB} - the minimum humidity of the soil; %

β_0 - maximum limited humidity in the soil volume unit

the composition to be accepted as equal to the molecular humidity capacity; %

V_0 - the speed of the sweep at the end of the first hour; m/s

K_b - coefficient depending on the properties and humidity of the soil;

t - the time when water is absorbed into the soil. s

The paraboloida radius () in the elliptical and elliptical view R is determined by the following formula:

$$R = [(\beta_{HB} - \beta_i)/(\beta_{HB} - \beta_0)][(V_0 - K_\phi)/K_b][1 - \exp(-K_b \cdot t)] \qquad (12)$$

At the same time, the number of vacuum cleaners () located on one hectare of the irrigated area n was determined by the following formula:

$$n = 10000 / (b_p \cdot l_k) \qquad (13)$$

This is the b_p distance between the vacuum cleaners, m;

l_k - distance between the rows, m;

The irrigation mechanism for one hectare of irrigation area was then determined by the following formula:

- In the case of small intensity of water supply, when soil moisture contours are in the form of an ellipse: N.N.Dubenok was determined by the formula:

$$m = 0{,}115 \cdot H \cdot R \cdot d \cdot (\beta_{HB} - \beta_{nn}) \cdot n \qquad (14)$$

- when the soil moisturization contours take shape in the same elliptical parabolo in a state of great slowness of water supply:

$$m = 1{,}57 \cdot H \cdot R2 \cdot d \cdot (\beta_{HB} - \beta_{nn}) \cdot n \qquad (15)$$

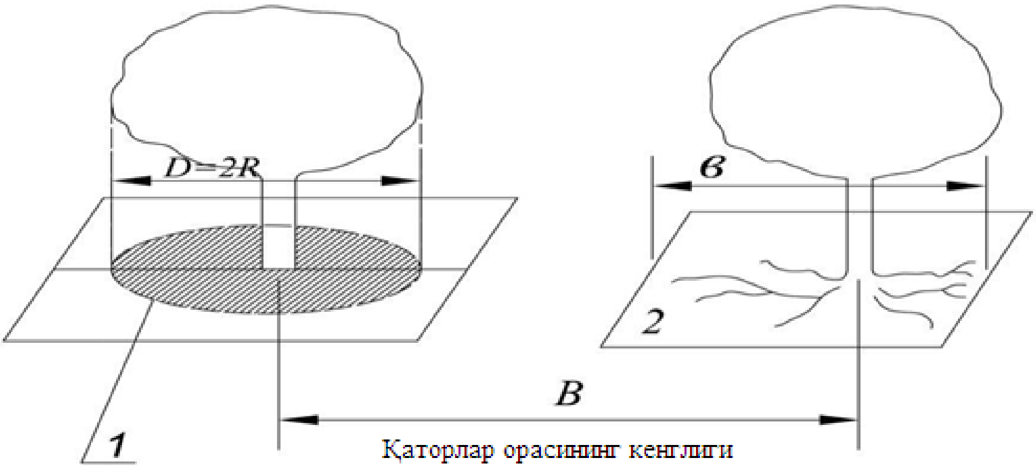

Figure 2. Dispersion area of source and pole moisture

1- the diameter of the moisture manabasi. Width of the 2nd moisture pole.

Figures 3 below show the moisture contours of the roots of the garden when irrigating drip.

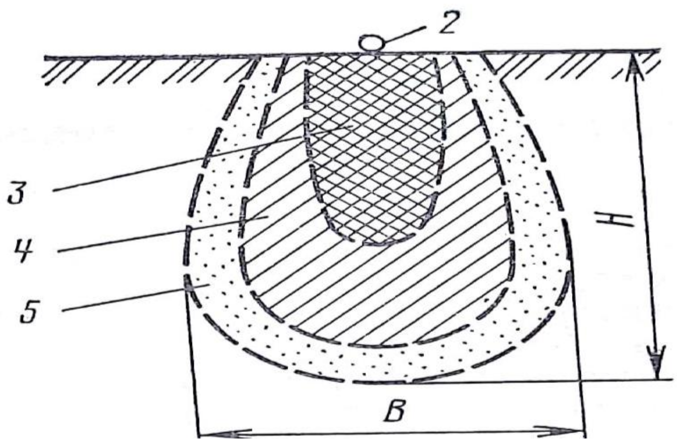

Figure 3. Characteristic contour of moisture in irrigation:

In lighter sand soils with hungry feathes according to the mechanical composition; Surface of soil 1; 2-drop micro water extractor; 3-multi-moistened soil layer; 4th normal wet soil layer; 5th partially moistened soil layer; 6th moisture distribution limit

Water points, the number and schemes of moisture fields depend on the type of crops and the water-physical properties of the soil.
The area being moistened by the feeders was measured by the following formula:

$$A_{dr} = n_{dr} A_i / (a \cdot b) \qquad (16)$$

here: n_{dr} - the number of reprolicas per plant, grain;

A_i - a moisturized area from one water extractor, m2;

$a \cdot b$ - planting scheme of plants, m^2.

Limited field wet capacity (ChDNS) of soil depends on the soil layer to be filled with capillary holes in the lower layers of the soil and at low levels in winter and high in autumn, depending on the level of soil. It is understood that water, which is absorbed into the soil to varying degrees by the limited field wet capacity of the soil, is the ability to hold in layers. The higher the humid capacity of the soil at the site of the experiment, the more moisture will be supplied in the soil for the plant. After the area is filled with water, it is covered with soil over it with a polyethylene film. After that, from the third day, soil samples were taken from 5 returns to the sizot level in every 10 cm layer to determine humidity. Soil samples were continued until the moisture reached a constant amount. The constant indicator of humidity was considered a limited field wet capacity. During the experiments to determine the limited field humidity, samples were taken from the fields and the amount of moisture was determined.

References

1. Butayarov A.T. Amu-Surxon irrigation system is a state of water use in the basin administration. Mejdunarodnaya conference innovationnoe razvitie nauki i obrozovaniya. November 2020 g. "Sbornik nauchnых trudov Pavlodar, Kazakhstan" November, 2020 g. -St. 132-139.
2. Isaeva A.A.Spravochnik ecology - climateheskix movement. g. Moscow.. MGU, 2005. -412 p.
3. Butayarov A.T. "Amu-Surxon" improves water usage on farms in the ITXB region. Special issue of "AGROILM" journal 4. (60). -Tashkent, 2019. –B. 79 - 81.
4. Sabirjan Isaev, Gulom Bekmirzaev, Mirkadir Usmanov, Elyor Malikov, Sunnat Tadjiev, Abdukadir Butayarov. Provision of remote methods for estimating soil salinity on meliorated lands. E3S Web of Conferences 376, 02014 (2023). https://doi.org/10.1051/e3sconf/202337602014. ERSME-2023
5. B.Serikbaev, A.Butayarov, S.Gulamov, S.Dustnazarova. Inflation of water to the soil in the fields of drop irrigation. E3S Web of Conferences 264, 04002 (2021). https://doi.org/10.1051/e3sconf/202126404002.
6. Butayarov A.T., Nazarov A. A. Scientific substantiation of technology of efficient use of water resources in irrigation of cotton. E3S Web of Conferences 401, 05048 (2023). https://doi.org/10.1051/e3sconf/202340105048.
7. Resolution of the President of the Republic of Uzbekistan, December 27, 2018, "On irrigation technologies for the production of raw materials," PQ -4087. Journal "Irrigation and Meliorative". Tashkent. 2019, No. 1 (15).Pp.80-82.

8. R.A.Mamutov, Sh.Z.Qochqorov, T.Z.Sultanov "Work is being done to improve the efficiency of the use of water-transfer technologies in water management." Journal "Irrigation and Meliorative". Tashkent. 2018. No. 3 (18). Pp.89-91.
9. M.X.Hamidov, B.U.Suvanov use drip irrigation technology to irrigate Gastrointestinal tract. Journal "Irrigation and Meliorative". Tashkent 2018. No. 4 (14). Pp.9-11.
10. Butayarov A.T. Amu-Surxon irrigatsiya tizim havza boshqarmasida suvdan foydalanish holati. " The Conference on Innovative And Innovative InnovationS of November 2020 ""Pavlodar, Kazakhstan"" was held in Astana." 132-139.
11. Improving water use on farms in the ITXB area of Butayarov A.T., Serikbayev B.S.Amu-Surxon. Scientific and methodical journal of scientific newsletter Of TerDU. No. 1. (01) September. –Thermal, 2019. -B. 16-19.
12. Intensive garden maintenance of Sha′drach, Me′shach and A·bed′ne·go. Agro Science Journal. –Surxondary, 2017. No. 6. Page 9.
13. Baraev F.A., Gulomov S.B., "The Application of Drip Irrigation Technology in Horticulture", "Uzbekistan Agriculture" magazine. –Surxondary, 2015. -No12.- B. 38-39.
14. Mamatov S.A. Drip Irrigation System (history, description, advantages, elements, design, construction and operation). Surkhandarya. Mehridaryo LLC. 2012. 80 b.
15. Butayarov A.T. "Amu-Surxon" improves water usage on farms in the ITXB region. Special issue of "AGROILM" journal 4. (60). -Tashkent, 2019. –B. 79 - 81.