



## **New biogeosystem technique method to regulate the soil solution content and concentration for optimal plant nutrition**

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The hydrological regime uncertainty is a natural hydroclimatic extreme's opportunity for biosphere's diversity. But its anthropogenic imitation as a reflection of Nature's carelessness has not to be apprehended as a basis of technology. But an imitation of nature hydrological regime is a foundation of current gravitational frontal continually-isotropic irrigation paradigm. In result the irrigation water consumption is up to 95 % of the world freshwater reserves. The systemic flaw of current irrigation paradigm is the simultaneity of the phase of water supply to soil, and the phase of water distribution throughout the soil.

After artificial watering the preferable water downward fluxes into vadose zone are up to 70 % of water supply. The soil over-moistening leads to super-disperse consistence of mineral-organic soil phase, thus the mineralogical, agro-physical, physicochemical properties of soil become unacceptable. The soil lost its structure because granulometric fraction's flotation decomposition, that influences badly a soil biota and a rhizosphere. The soil full water capacity (water thermodynamic potential of 0.0 MPa) transforms to water field capacity (water thermodynamic potential from -0.01 to -0.03 MPa). At high potential the stomatal apparatus of plants is fully opened, transpiration rate is maximal. The water irrigation consumption is 4–15 times higher of empirically designed irrigation water demand of plants.

The Biogeosystem Technique (BGT\*) transcendental non-imitational concept of land-use is proposed to use the niche of non-contradictory technological development in biosphere. The BGT\* intra-soil pulse continuous-discrete watering provides a moveable syringe injection of water discrete portion directly into individual watering vertical soil cylinder of 1.5–2.5 cm diameter at depth from 10 to 35 cm. After injection, in 5–10 min the soil water redistributes in resulted cylinder of 2-4 cm diameter at depth from 5 to 50 cm by capillary, film and vapor transfer. Lateral distance between subsequent discrete injections is of 10–15 cm. An ambient soil carcass is dry and mechanically stable. Mean thermodynamic soil water potential after watering is of -0.2 MPa. After water injection the structure of soil in the resulted cylinder restores quickly because no compression from the stable adjoining soil volume. Soil solution concentration is optimal for plant nutrition, stomatal apparatus is in a regulation mode, a plant organogenesis is optimal. No excessive intra-soil mass transfer, plant transpiration, evaporation and seepage of water from soil. The soil health and plant's biological productivity are highest. At intra-soil pulse continuous-discrete plants watering technology the consumption of fresh water is 4-20 times less compared to standard irrigation. Robotic intra-soil pulse continuous-discrete irrigation technologies are available. The hydrological regime will become certain. A possibility to reduce the hydroclimatic extremes and obtain more vast and productive area of the Earth's biosphere is real.

Key words: irrigation paradigm, Biogeosystem Technique, intra-soil pulse continuous-discrete watering, biosphere's hydrological regime.

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